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Changes in Child Symptomatology Associated with Animal-Assisted Therapy

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CHANGES IN CHILD SYMPTOMATOLOGY ASSOCIATED WITH ANIMAL-ASSISTED THERAPY

by

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ABSTRACT

Changes in Child Symptomatology Associated

with Animal-Assisted Therapy

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This study examined the changes in symptoms of anxiety, depression, and social dysfunction associated with a history of child trauma after adding animal-assisted therapy (AAT) to conventional psychotherapy for adolescents living in a residential treatment facility in northern California. Using a quasiexperimental design, participants were followed over a period of nine weeks, with both groups completing the State-Trait Anxiety Inventory, the Beck Depression Inventory, an abbreviated version of the Beck Depression Inventory, and the Youth Self-Report, and residential staff completing the Youth Outcome Questionnaire at three time points. In addition, the treatment group completed state anxiety and depression assessments before and after receiving the adjunctive AAT at each of these assessment points. Analyses suggest that the treatment group mean depression score was lower than the control group's score, but only at week 5. The significance of group differences in mean anxiety at posttest assessments could not be determined due to pretreatment group differences. Within-subjects analyses

suggest that the treatment group experienced significant reductions in mean state anxiety scores after receiving the AAT at each of the three assessment points over the nine weeks. These reductions in anxiety were not, however, maintained between assessments. No significant changes in self- or other-reported social behaviors were found. Implications of these findings are discussed as well as suggestions for future research.

(154 pages)

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"Oh, why don't you go back and get your Ph.D.?" It seemed a simple enough question.

Well, five years later, I would like to thank my parents, Mom and Ted, for their monumental and unwavering support as well as the rest of my family, Colleen, Kristi, and Greg, who always offered a sympathetic ear and a positive outlook. I also want to thank my dearest friends, Sergio, Katie, Jonathan, Courtney, and Jamie, without whose patience, humor, and encouragement I could not have survived the moves, poverty, frustration, or questioning.

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Catherine C. Woolley

CONTENTS

Page

Page

LIST OF TABLES

Table Page

LIST OF GRAPHS

Graph Page

CHAPTER I

INTRODUCTION

Victims of childhood abuse may suffer from a multitude of negative outcomes as a result of their traumatic experience(s). These outcomes can be as diverse as the child population itself and may include psychological disorders in addition to physical ailments. Although not every act of victimization results in psychopathology or permanent physical disability, the potential effects of child maltreatment are a serious concern and should be addressed.

Several studies have been conducted to assess the psychological effects of childhood abuse. Reviews of primarily retrospective studies indicate that a general categorization of abused children would include those children who are severely disturbed as a result of the victimization, children mildly to moderately disturbed, children who are asymptomatic, and those who show delayed onset of symptoms. Additionally, degree of symptomatology has been shown to be differentially associated with the following abuse characteristics: age of victimization, duration and frequency of victimization (e.g., one-time assault or years of perpetration), relationship to the perpetrator, response from the mother, and specifically in cases of sexual abuse, use of force, penetration, ritualistic tendencies, and the presence of multiple perpetrators (Briere, 1988).

It appears that substantial agreement exists regarding the impact of child abuse: most researchers have concluded that this type of victimization can result in both short-term and long-term psychological difficulties. Although many studies explore the effects of a single category of abuse (e.g., physical abuse only), exposure to multiple forms of

abuse is more common (Wolfe & McGee, 1994). Additionally, it is important to note that research in this area has generally not shown a consistent relationship between a specific form of maltreatment and a particular outcome (Ammerman, 1992). That said, the following outcomes have been shown to be frequently associated with the four major forms of child abuse.

1. Physical Abuse Correlates. These include depression (Andrews, Valentine, & Valentine, 1995; Brown, Cohen, Johnson, & Smailes, 1999; Downey, Feldman, Khuri, & Friedman, 1994; Green, 1993; Roosa, Reinholtz, & Angelini, 1999), anxiety (Kumar, Steer, & Deblinger, 1996; Mancini, Van-Ameringen, & MacMillan, 1995; Stein et al., 1996), increased aggressivity and hostility, suicidality, low self-esteem, self-destructive behaviors, and academic and intellectual delays (Salzinger, Kaplan, Pelcovitz, Samit, & Krieger, 1984).

2. Neglect Correlates. These include depression (Brown, 1996; Downey et al., 1994; Green, 1993; Toth, Manly, & Cicchetti, 1992), anxiety (Ammerman, Cassisi, Hersen, & Van-Hasselt, 1986), language and intellectual deficits (Crouch & Milner, 1993), low self-esteem, and poor social relationships.

3. Sexual Abuse Correlates. These include depression (Andrews et al., 1995; Boney-McCoy & Finkelhor, 1996; Briere, 1988; Brown et al., 1999; Conte, 1988; de Jong & Gorey, 1996; Finkelhor, 1988, 1990; Green, 1993; King et al., 1999; Lipovsky, Saunders, & Murphy, 1989; Mennen & Meadow, 1994; Mian, Marton, & LeBaron, 1996; O'Donohue & Elliott, 1992; Putnam, 2003; Putnam & Trickett, 1997; Roosa et al., 1999; Stauffer & Deblinger, 1996), anxiety (Boney-McCoy & Finkelhor, 1996; Briere, 1988;

de Jong & Gorey, 1996; Finkelhor, 1988, 1990; Grayston, de Luca, & Boyes, 1992; King et al., 1999; Lipovsky et al., 1989; Mennen & Meadow, 1994; Mian et al., 1996; Putnam, 2003; Stein et al., 1996), posttraumatic stress disorder (Boney-McCoy & Finkelhor, 1996; Conte, 1988; de Jong & Gorey, 1996; Finkelhor, 1988, 1990; King et al., 1999; Mian et al., 1996; Putnam & Trickett, 1997), dissociative identity disorder (associated with severe trauma), poor self-esteem, aggressiveness, sexual acting-out, self-mutilating behaviors, substance abuse, and poor peer relations.

4. Emotional Abuse Correlates. It has been suggested that emotional abuse may result in the most deleterious consequences of all forms of abuse (e.g., Hamerman & Ludwig, 2000). Of the many possible outcomes associated with psychological abuse, some commonly cited include depression (Ferguson & Dacey, 1997; Katz & Arias, 1999; Kent & Waller, 1998), anxiety (Ferguson & Dacey; Kent & Waller, 2000), low self-esteem (Garbarino, Guttman, & Seeley, 1986; Kent & Waller), and dissociation (Ferguson & Dacey).

Although there does not seem to be a "typical effect" any more than there exists a "typical victimization," it appears that two commonly mentioned pathologies in the literature are symptoms of depression and anxiety.

Clearly, it is imperative to offer some form of treatment to affected victims of child abuse. Over the past 100 years, treatment has taken many forms, including cognitive-behavioral, psychodynamic, behavioral, and group therapies; perhaps more frequently, though, no treatment has taken place (Herman, 1997). Recently, however, an innovative adjunctive intervention, animal-assisted therapy (AAT), has been introduced to ameliorate

a variety of ailments. Animal-Assisted Therapy involves the use of an animal who is a prescribed part of the therapeutic process (used generically in the literature to refer to both physical and psychological domains). As will be discussed, it has been suggested that animals have qualities similar to those of a good therapist (Mallon, 1994a) in addition to their association with positive health outcomes for humans.

In the medical literature, outcome studies of pet animal companionship have suggested effects such as longer life expectancies and lower blood pressure and heart rates (Brasic, 1998; Freedman, Catcher, Lynch, & Thomas, 1980; Freedman, Catcher, Thomas, Lynch, & Maisonette, 1983; Jenkins, 1986; Vormbrock & Grossberg, 1988). In the psychological literature, reports of the healing properties of animals have come from a variety of venues including private therapy, psychiatric hospitals, prisons, and nursing homes. Among the reported psychological outcomes associated with AAT are ameliorative effects on depression and anxiety (Barker & Dawson, 1998; Brickel, 1984; Davis, 1988; Dossey, 1997; Folse, Minder, Aycock, & Santana, 1994; Holcomb & Meacham, 1989; Katcher, Segal, & Beck, 1984a, 1984b; Wilson, 1991).

Despite the conclusions of these descriptive (and a few experimental) studies, very little research has investigated the effects of AAT on an abused sample of adolescents who oftentimes suffer from depression and anxiety as a result of their abuse (although programs do exist that provide AAT to groups of children with abuse histories; see Roseberry & Rovin, 1999). Therefore, little information exists regarding the possible therapeutic benefits of AAT on child victims of abuse.

Given the potential deleterious effects of child maltreatment, it seems clear that gaining a better understanding of the effects of AAT on child victims could positively impact the field of child maltreatment. Thus, the intention of this study was to explore changes in symptomatology associated with AAT. Specifically, this quasi-experimental research explored anxiety and depression levels as well as behavioral indices with child victims who experience AAT as an adjunct to conventional psychotherapy. Assessments were conducted during week 1, week 5, and week 9 of a 9-week data collection period in an attempt to avoid subject apathy that might result weekly assessments. The specific hypotheses were: (a) At the end of nine weeks of treatment, the experimental (AAT) group would show significantly greater reductions in depression, state anxiety (due to the enduring nature of trait anxiety, the intervention was not expected to impact this variable), and behavioral problems than the control (Conventional) group as measured by the Beck Depression Inventory, State-Trait Anxiety Inventory, and the Youth Self-Report/Youth Outcome Questionnaire, respectively; and (b) within the experimental (AAT) group, reductions in depression and state anxiety would be shown between weekly pre- and posttests as measured by the Beck Depression Inventory and the State-Trait Anxiety Inventory, respectively.

CHAPTER II

REVIEW OF THE LITERATURE

This review of the literature begins with an overview of research on child abuse and its effects, followed by a discussion of the recent literature on AAT. As the sample used for this study had an abuse history, the bulk of the literature review focuses on child maltreatment. This examination of the literature will demonstrate the logic underlying the use of this adjunctive therapy with the specific population of child abuse victims, from which recommendations for further research will be made. The review provides support for exploring the impact of AAT on child/adolescent victims' anxiety and depression levels and concomitant behaviors.

Before examining definitions of the four major types of child maltreatment and their rates of occurrence in the population, it is important to consider the various ways in which these forms of abuse have been conceptualized. Clearly, this variation can produce what appear to be conflicting incidence rates. Understanding the difference between the "Harm Standard" and the "Endangerment Standard" may serve to reduce confusion.

As defined in the *Third National Incidence Study of Child Abuse and Neglect* (Sedlak & Broadhurst, 1996), for maltreatment to be counted under the National Incidence Study (NIS) Harm Standard, it is "generally necessary that the child have suffered demonstrable harm as a result of the maltreatment" (pp. 2-9). Further, the Harm Standard requires abuse and/or neglect to have been experienced at the hands of a parent

or parent-substitute. Finally, this standard requires that children be *moderately* harmed by abuse and *seriously* harmed by neglect before being counted in the estimates.

The "Endangerment Standard" is considered less stringent than the above mentioned Harm Standard. A broader category (it includes all children estimated using the Harm Standard), the Endangerment Standard "adds in those children who have not yet been harmed by maltreatment but who experienced abuse or neglect that put them in danger of being harmed, according to the views of community professionals or CPS agencies" (Sedlak & Broadhurst, 1996, pp. 2-9). Additionally, the perpetrator criteria are more inclusive, thereby capturing a greater portion of abuse and/or potential abuse cases. For the purposes of this report, estimates will reflect those children whose maltreatment meets the requirements of the *Harm Standard.*

Child Physical Abuse.

Definition

Although all forms of child maltreatment are variously defined by individual state legislatures, the Federal Child Abuse Prevention and Treatment Act (CAPTA, 42 U.S.C.A. § 106g) provides a framework for states by identifying the minimum requirements for acts or behaviors that define maltreatment. Accordingly, physical abuse is characterized by the "non-accidental" (American Humane Association, 1997a) infliction of physical injury as a result of punching, beating, kicking, biting, burning, shaking, or otherwise harming a child, even if the parent did not intend to injury the child (e.g., as a result of overdiscipline or physical punishment).

Incidence

An unfortunate result of the states' ability to individually define abuse and neglect is the difficulty in estimating rates of occurrence. The estimating procedure is further complicated by wide variation in states' data collection processes (Wang & Daro, 1997). Regardless, all estimates conclude that a significant increase in reported abuse has occurred in recent years (e.g., AHA Fact Sheet, 1997b; Sedlak & Broadhurst, 1996; Wang & Daro).

Based on 1995 data, there were 1,000,000 confirmed cases of child maltreatment (AHA, 1997a, 1997b). Of these, approximately 25% involved physical abuse. Based on 1993 data, the *Third National Incidence Study of Child Abuse and Neglect* (NIS-3, 1996) estimated that physical abuse was experienced by 5.7 per 1,000 children, or approximately 381,700 children. It seems probable that the discrepancy (i.e., lack of expected increase) between these two sets of data (i.e., 1993 = 381,700 vs. 1995 = 250,000) is explained by the fact that the NIS-3 numbers represent estimates of all children who experienced physical abuse as determined by a multitude of agencies, not just cases confirmed by children's protective agencies.

Developmental Sequelae Associated with Physical Abuse

Retrospective studies suggest that among the possible outcomes associated with child physical abuse, two commonly reported effects are depression (Andrews et al., 1995; Bohn, 2003; Brown et al., 1999; Downey et al., 1994; Green, 1993; Paunovic, 2002; Roosa et al., 1999) and anxiety (Gibb, Butler, & Beck, 2003; Kumar et al., 1996; Mancini

et al., 1995; Maxwell, 2003; Stein et al., 1996). Additional effects reported include aggressivity and hostility (Kolko, 1992; Wolfe, 1987), posttraumatic stress disorder (Paunovic), suicidality (Bohn), low self-esteem, self-destructive behaviors, and academic and intellectual delays (Salzinger et al., 1984).

Child Neglect

Definition

The most common form of maltreatment, child neglect is characterized by a failure to provide for the child's basic, age-appropriate needs (National Clearinghouse on Child Abuse and Neglect Information, 2000; NCCANI). *Physical neglect* includes "refusal or delay in seeking health care, abandonment, expulsion from the home, or refusal to allow a runaway to return home, and inadequate supervision" (p. 2). *Educational neglect* includes the "allowance of chronic truancy, failure to enroll a child of mandatory school age in school, and failure to attend to a special educational need" (p. 2). *Emotional neglect* includes "such actions as marked inattention to the child's needs for affection, refusal of or failure to provide needed psychological care, spouse abuse in the child's presence, and permission of drug or alcohol use by the child" (p. 2). When making determinations regarding neglect, one must take into consideration cultural norms and standards as well as conditions of poverty.

Incidence

According to the NIS-3 Harm Standard Estimates (Sedlak, & Broadhurst, 1996),

educational neglect accounted for the largest proportion of all neglect cases, occurring at a rate of 5.9 per 1,000 children; *physical neglect* and *emotional neglect* each occurred at a rate of 5.0 and 3.2 per 1,000, respectively. Across various assessment periods, child neglect has consistently accounted for approximately 50% of all cases of maltreatment (e.g., AHA, 1997b; NCCANI, 2000).

Developmental Sequelae Associated with Child Neglect

Retrospective studies suggest that outcomes associated with neglect include depression (Brown, 1996; Downey et al., 1994; Green, 1993; Toth et al., 1992), anxiety (Ammerman et al., 1986), language and intellectual deficits (Crouch & Milner, 1993), low self-esteem, and poor social relationships (Hoffman-Plotkin & Twentyman, 1984).

Emotional Abuse.

Definition

Emotional or psychological abuse includes "acts or omissions by the parents or other caregivers that have caused, or could cause, serious behavioral, cognitive, emotional, or mental disorders" (NCCANI, 2000, p. 3). Thought to accompany all other forms of abuse (as well as to occur independently; Hamerman & Ludwig, 2000; NCCANI, 2000; Navarre, 1987), emotional abuse is perhaps the least well understood or studied form of maltreatment due to the intangible nature of the evidence (Kavanagh, 1982; Ranney & Cottone, 1991). Some researchers (e.g., Katz & Arias, 1999) have identified two forms of emotional abuse: emotional/verbal and dominance/isolation. The first refers

to acts such as constant belittling, verbal assault, insulting, criticizing, rejecting, and teasing (Child Abuse Prevention Networks, 1991, CAPN; Hamerman & Ludwig, 2000) while dominance/isolation includes acts such exploitation and confinement (Hamerman & Ludwig; Katz & Arias; NCCANI).

Incidence

Accounting for the lowest rates per 1,000 children, emotional abuse occurs in 3.0 of 1,000 children (Sedlak & Broadhurst, 1996). Of course, due to the generally unobservable consequences of this insidious form of maltreatment, it is probable that these data significantly underestimate its actual rate of occurrence (Hamerman & Ludwig, 2000).

Developmental Sequelae Associated with Emotional Abuse

It has been suggested that emotional abuse may result in the most deleterious consequences of all forms of abuse (e.g., Hamerman & Ludwig, 2000). Of the many possible outcomes associated with psychological abuse, the most commonly cited include depression (Ferguson & Dacey, 1997; Gibb et al., 2003; Katz & Arias, 1999; Kent & Waller, 1998), anxiety (Ferguson & Dacey; Kent & Waller; Maxwell, 2003), low self-esteem (Garbarino et al., 1986; Kent & Waller; Maxwell), and dissociation (Ferguson & Dacey).

Child Sexual Abuse

Definition

Child sexual abuse can be defined as: "The involvement of dependent, developmentally immature children...in sexual activities that they do not fully comprehend, are unable to give their informed consent to and that violate the social taboos of family roles" (Schechter & Roberge, 1976, p. 129, cited in Mian, Marton, & LeBaron, 1996).

Incidence

It should be noted that the literature on child sexual abuse is quite extensive. For perspective, a key word search using "child," "sexual," and "abuse" in the *Social Sciences Abstracts* yielded 1,426 articles; the same key word search in *Medline* resulted in 5,909 citations. The implication seems to be that child sexual abuse is a common phenomenon and worthy of exploration, even across disciplines.

In a retrospective study, Anderson, Martin, Mullen, Romans, and Herbison (1993), estimated that as many as 54% of girls and 18% of boys experience sexual abuse before the age of 18. The most recent government statistics (U.S. Department of Health and Human Services, 1996a, 1996b) for 1993 and 1994 reported that national incidence rates for child sexual abuse were 3.2/1,000 and 2/1,000, respectively. However, Finkelhor and Dziuba-Leatherman (1994) conducted a national survey that same year and suggested that annual rates for sexual abuse may be as high as 11/1,000. The discrepancy between these findings and those of the U.S. government may be explained by Finkelhor and Dziuba-

Leatherman's finding that as few as one in four incidents of child victimization (all forms) were reported to authorities.

Developmental Sequelae Associated with Sexual Abuse

Early reviews of the literature (e.g., Browne & Finkelhor, 1987; Finkelhor, 1990) noted the following outcomes associated with child sexual abuse: depression (Barbe, Bridge, Birmaher, Kolko, & Brent, 2004; Gibb et al., 2003; Paunovic, 2002; Putnam, 2003), anxiety (Gibb et al., 2003), substance abuse (Messman-Moore & Long, 2003; Tyler, 2002), anger, suicide (Tyler), negative self-concept, self-destructive behavior/self-mutilation, inappropriate sexual behavior (Messman-Moore & Long; Putnam), dissociation (Messman-Moore & Long) , and posttraumatic stress disorder (Kreidler, Briscoe, & Beech, 2002; Messman-Moore & Long; see Table A.1 of Appendix A). For the most current review of the literature, see Putnam.

Perhaps the most controversial review is a meta-analysis conducted by Rind and Tromovitch (1997), which later became material for Congressional hearings on research on the effects of childhood sexual abuse. In this review, the authors broadly criticized the research in the field for basing conclusions on only clinical or forensic samples that were not "representative of the general population" (p. 253). The authors' highly debatable conclusions were that there was no support for the widely held belief that child sexual abuse "causes pervasive, intense, psychological harm" (p. 253) and, in fact, that even the agreed upon adjustment issues associated with sexual abuse were of small magnitude. Noteworthy is that Rind and Tromovitch based many of their conclusions on college

samples who were arguably not representative of the general population. As is noted in Table A.1of Appendix A, there was extensive overlap in the effects noted by Rind and Tromovitch and Finkelhor (1990) and Browne and Finkelhor (1987).

Proposed Explanatory Hypotheses of Abuse Correlates

To help understand the nature of maltreatment outcomes, several hypotheses have been posited, each attempting to account for the variation in sequelae seen across studies and forms of maltreatment. Excepting Finkelhor and Browne's (1986) *Traumagenic Model,* which focuses mainly on child sexual abuse effects, few comprehensive models exist. Still, important advances in a conceptualization of abuse outcomes have been made; a few of the more convincing ideas will be discussed in this dissertation.

Finkelhor and Browne's Traumagenic Model

Finkelhor and Browne (1986) presented perhaps the most parsimonious model for understanding how and why child sexual abuse results in specific types of trauma. The model identifies four "traumagenic dynamics" (p. 633; or, trauma-causing factors) that include: traumatic sexualization, betrayal, powerlessness, and stigmatization. Finkelhor and Browne point out that each of these dynamics by itself is not unique to sexual abuse, but rather to trauma generally. However, the combination of these dynamics in "one set of circumstances is what makes the trauma of sexual abuse unique" (p. 633) and different from other childhood trauma (e.g., divorce). Further, the authors demonstrate the utility of their model in conceptualizing child sexual abuse by identifying the psychological

impact and behavioral manifestations associated with each trauma-causing factor, noting that depression is most closely connected to betrayal, powerlessness, and stigmatization. These four traumagenic dynamics will each be discussed below.

Traumatic Sexualization

Traumatic sexualization "refers to a process in which a child's sexuality (including both feelings and sexual attitudes) is shaped in a developmentally inappropriate and interpersonally dysfunctional fashion as a result of sexual abuse" (Finkelhor & Browne, 1986, p. 633). Abuse experiences can result in various amounts and kinds of traumatic sexualization. Clearly, some abuse events are more sexualizing than others (e.g., offender attempts to evoke a sexual response in child). Among other outcomes, children who have been traumatically sexualized show confusion around sexual self-concept as well as aberrant emotional associations to sexual activities. The psychological impact of traumatic sexualization can include confusion about sexual norms and identity, confusion of sex with love and care-getting/care-giving, and aversion to sex/intimacy. Behaviorally, traumatic sexualization may manifest itself through sexual preoccupation, precocious or aggressive sexual activity, prostitution, and sexual dysfunctions.

Betrayal

Betrayal refers to the "dynamic by which children discover that someone on whom they were vitally dependent has caused them harm" (Finkelhore & Browne, 1986, p. 634). Children can experience betrayal not only by the molester, but also potentially from family members who do not support or believe them, or who were unwilling or unable to protect

them from the abuse. Degree of feelings of betrayal is a function of how "taken in" the child feels by the offender (indicating that abuse by family members does not conclusively offer the most potential for betrayal). The psychological impact of betrayal may include depression, dependency, impaired ability to judge the trustworthiness of others, mistrust, and anger/hostility. Betrayal's behavioral indicators may include clinginess, vulnerability to further abuse (including perpetuating the cycle of abuse with offspring), isolation, and discomfort in intimate relationships.

Powerlessness

Powerlessness (or disempowerment) refers to the process by which "the child's will, desires, and sense of efficacy are continually contravened" (Finkelhor & Browne, 1986, p. 635). Powerlessness, which occurs when the child's space (i.e., body) is repetitively invaded, is exacerbated by force and manipulation. Disempowerment is reinforced when the child perceives his/her attempts to thwart the abuse as fruitless and can occur anytime the child feels "trapped." Degree of powerlessness is determined by the amount of fear a child feels and can also be affected by the child's ability to convince adults of the abuse as well as his/her realization of how "conditions of dependency have trapped them in the situation" (p. 635). The psychological impact of powerlessness may include: anxiety and fear, lowered sense of self-efficacy, perception of self as victim, and an increased need to control. Behaviorally, powerlessness may manifest itself through nightmares, phobias, somatic complaints, depression, school problems, dissociation, and becoming an abuser.

Stigmatization

Stigmatization refers to the "negative connotations (e.g., badness, shame, and guilt) that are communicated to the child around the experiences and that then become incorporated into the child's self-image" (Finkelhor & Browne, 1986, p. 635). These negative messages (e.g., "spoiled goods") are communicated to the child by the offender as well as by family and community members. This is particularly true if people respond to the disclosure with shock or horror or blame the child for the abuse. Many variables impact the sense of stigmatization, including dealings with the molester, feedback from others postdisclosure, and the fact of keeping the abuse secret, which reinforces the idea of being "different." The psychological impact of stigmatization may include guilt and shame, lowered self-esteem, and a sense of differentness from others. Behaviorally, these children may present with drug or alcohol abuse, criminal involvement, self-mutilation, or suicidal behavior.

Additional Models

A second set of ideas proposed to help explain the relationships between abusive actions and potentially damaging outcomes comes from Navarre (1987). Arguing that psychological maltreatment accompanies all other forms of abuse, Navarre suggested that "repetition and/or long-term experience of pain is physically exhausting and may induce a degree of attention to management or prevention of the repetition of pain that reduces the amount of attention available for investment in other necessary activities" (p. 50). From a developmental perspective, it is foreseeable that this diversion of attention away from

other developmentally appropriate tasks could negatively influence a multitude of cognitive, behavioral, and socioemotional achievements.

A host of additional theoretical models exist to help explain the presence of depression and anxiety among maltreated youth. Although no single theory fully explains the observed sequelae, each contributes significantly to the puzzle. For example, *biological and genetic theories* address the role of genetic predisposition toward psychopathology among abusive families (e.g., Gershon, Berrettini, Nurnberger, & Goldin, 1989; Wagner, 1991) and possible effects on the hypothalamic-pituitary-adrenal (HPA) functioning (associated with vulnerability to depressive symptoms) of child sexual abuse survivors (Weiss, Longhurst, & Mazure, 1999). *Information processing theories* emphasize cognitive distortions and maladaptive schema utilized by victims, especially around the notions of trust, self, others, power and control, and safety of the environment (Briere, 1988; Chard, Weaver, & Resick, 1997; Cole & Putnam, 1992; Hartman & Burgess, 1993; Smucker & Dancu, 1999), which might impact symptoms of depression and anxiety. Models of *learned helplessness* make a link between victims' feelings of helplessness and powerlessness that accompany the understanding that one is incapable of avoiding abusive interactions with the perpetrator and resulting in depressive symptoms (Boney-McCoy & Finkelhor, 1996; Kelly, 1986). Finally, *attachment theory* suggests that the insecure attachments experienced by maltreated children form the basis of later interpersonal difficulties and various types of psychopathology (Bagley & Young, 1998; Bifulco, Brown, & Adler, 1991; Blumberg, 1981).

Animals and Animal-Assisted Therapy: An Integrated Review of Primary Research.

Unlike our knowledge of child maltreatment, what is known about the effects of exposure to animals and more specifically, AAT, is relatively sparse. This is not to say that practitioners and laypersons have not taken notice of the apparent relationship between contact with animals and positive human health outcomes. Rather, our current "knowledge" is based primarily on anecdotal accounts, not rigorous experimental designs or attempts to quantify observations.

With this limitation noted, the following will highlight outcomes that have been suggested in the literature regarding a range of animal-related situations (e.g., visiting unknown animals, visiting pets, observing animals, petting animals, engaging with an animal in a therapeutic environment) and their effects on humans. Clarifying this "range," much of the research has investigated health (both physiological and psychological) and social outcomes as a function of animal *ownership* primarily (i.e., influence of pets in the home), animal *presence* secondarily (e.g., influence of unknown animals who are not an integral part of treatment), and finally, *animal-assisted therapy* (i.e., animals who are part of a goal-directed intervention) and its unique contribution. Therefore, direct comparison among outcomes is difficult at best.

Nature of Human-Animal Therapeutic Relations

Perhaps first and foremost, animals have been considered to play a therapeutic role for humans based on the observation that they have attributes similar to those of a good

therapist (Mallon, 1994b). Credit for this initial insight is usually given to Boris Levinson, who watched as a difficult-to-reach child client "opened up" to Levinson's dog, Jingles (Levinson, 1969). Levinson believed that pets could function as "transitional objects" so that a child could form a relationship first with the pet, then with the therapist, and later, with other people (McCulloch, 1983).

Since that time, many practitioners have supported Levinson by observing that animals provide unconditional love and acceptance (Bardill & Hutchinson, 1997; Corson, Corson, Gwynne, & Arnold, 1975; Hoelscher & Garfat, 1993; Kongable, Stolley, & Buckwalter, 1990; Levinson, 1969, 1972; Mallon, 1994a; Muschel, 1984; Pereti, 1990; Price, 1996; Stawar, 2000; Wells, Rosen, & Walshaw, 1997; Zasloff & Kidd, 1994) as well as a nonthreatening (Banman, 1995; Bardill & Hutchinson, 1997; Friedmann et al., 1983) and nonjudgmental environment (George, 1988; Mallon, 1994a; Roseberry & Rovin, 1999; Siegel, 1993). Similar to these concepts, others have mentioned that animals create both a physically and emotionally safe environment (Bardill & Hutchinson; Doe, 1998; Roseberry & Rovin; Zasloff & Kidd), which can reduce fear of harm or rejection (Golin & Walsh, 1994) as well as promote the expression of feelings and emotions (Golin & Walsh; Hoelscher & Garfat; Mallon, 1994a; Reichert, 1994, 1998; Roseberry & Rovin; Wells et al., 1997).

Animals are Good Listeners

For the clinician, these animal attributes actually fulfill Carl Roger's requirements for therapeutic change (Scharf, 2000). As noted above, animals care for the "client"

unconditionally and provide genuineness, acceptance, and empathy (Scharf, p. 211). Serpell (1988) noted animals' ability to detect subtle variation in human emotions and even posture, which could be construed as part of the empathic process. According to Rogers, all of these factors can lead to self-actualization, which promotes fuller self-expression.

Animals Facilitate Communication

The ability to facilitate the expression of emotions is obviously a critical element of the therapeutic experience, especially for children who have experienced trauma. Corson et al. (1975) identified this beneficial skill of animals, referring to animals as a "catalytic vehicle" (p. 71) for social interaction and as a "social link" (p. 65). Corson et al. further discuss a "widening circle of warmth and approval" (p. 65), whereby patients would trust and interact first with the animal, then with the therapist, and finally with others, offering support for Levinson's (1969) hypothesis mentioned above.

Recently, practitioners are again describing animals as "vehicles for communication" (e.g., Wells et al., 1997). For example, one aspect of this concept is supported by several studies that have examined animals' ability to facilitate verbal communication among speech-delayed or noncommunicative children (e.g., Autistic, Down Syndrome; Condoret, 1983; Limond, Bradshaw, & Cormack, 1997; Nathanson, de Castro, Friend, & McMahon, 1997; Smith, 1983) as well as patients identified as "isolated" (Beck, Seraydarian, & Hunter, 1986; Carmack, 1984; Twiname, 1985). Beck et al. additionally found that the presence of animals was related to increased attendance

by inpatients in supplemental occupational therapy groups, presumed to facilitate the therapeutic process.

However, it seems that the broader interpretation of Corson and colleagues' (1975) "social lubricant" hypothesis is that animals give clients and people in general something to talk about and someone comfortable to talk to. For example, regarding animals as a *topic for discussion,* Nielsen and Delude (1994) found that a tank of guppies and a cage of guinea pigs provided former inpatients in an interim residence a common interest about which to discuss daily routines. Nathanson et al. (1997) found that severely disabled, noncommunicative children said first words within two weeks of initiating a dolphin-assisted therapy program, compared with a control group, whose first words were not recorded until after 6 months of conventional speech therapy. Interestingly, the experimental group's first words were all related to the dolphin activities. Similar findings were seen in a group of Down Syndrome children whose overall language output increased significantly in the presence of a therapy dog and, moreover, the greatest portion of verbalizations concerned the pet therapist (Limond et al., 1997).

Regarding animals as someone *to talk to,* clinicians observe that some clients are often more inclined to share emotionally difficult experiences directly with the therapy animal than with the therapist (Wells et al., 1997), just as Levinson (1969) had observed years ago. In addition to the possible explanations previously mentioned, it seems likely that distressed individuals feel comfortable sharing with animals because those animals are seen as friends and companions (Angulo, Siegel, & Detels, 1996; Banman, 1995; Mallon, 1994b; Okoniewski, 1984; Peretti, 1990; Robin, ten Bensel, Quigley, & Anderson, 1984;

Shaw & Fisher, 1940; Siegel, 1995; Staats, Pierfelice, Kim, & Crandell, 1999). In fact, a 1940s book entitled, *Animals as Friends and How to Keep Them*, outlined the importance of connecting with creatures of all sorts and gave recommendations for helping to "make your pet, not a captive, but a friend" (Shaw & Fisher, 1940, p. xvi). Several authors (e.g., Banman; Okoniewski) have suggested that some patients may actually relate better to animals than to other people. In fact, Peretti found 67-75% of a sample of elderly individuals reported their dog as their ONLY friend.

Psychopathological Factors

Thus far, this review has posited several character traits of animals as well as our perception of such animals that may enhance their ability to form therapeutic relationships with humans. Clearly, many of these characteristics "fit" intuitively with the needs of abused and neglected children and adolescents. But, what about the role animals might play in ameliorating the more pathological outcomes associated with child maltreatment?

Animals and Stress/Anxiety

Perhaps the hallmark of research exploring the effect of animals on health outcomes was a study by Friedmann et al. (1980). Here, the findings suggest that animal companions are related to increased survival rates for patients one year after discharge from a coronary care unit. The authors proposed that the "absence of significant companions may interfere with peoples' ability to maintain normal activity levels and healthy behaviors" (p. 307), which influence the progress of illness. Similarly, Proulx

(1998) found that pet therapists were associated with improved patient recovery from an intensive care unit.

Since then, several more studies have been conducted to examine physiological effects of animals on humans, specifically stress and anxiety. The majority of this research has used measures of heart rate and/or blood pressure as dependent variables (Anderson, Reid, & Jennings, 1992; Baun, Bergstrom, Langston, & Thoma, 1984; Eddy, 1995, 1996; Friedmann et al., 1983; Jenkins, 1986; Nagengast, Baun, Megel, & Leibowitz, 1997; Vormbrock & Grossberg, 1988; Walsh, Mertin, Verlander, & Pollard, 1995; Wilson, 1991), drawing the conclusion that decreases seen in both indicate the anxiolytic effects of the animals. In other words, these studies suggest that animals are associated with a reduction in stress and anxiety and, thus, have a "calming effect" on some people (even if only observing the animals; see Katcher et al., 1984b). However, as noted by Friedmann (2000), attitudes and attachments play key roles in the effects of animals on health.

Explanatory Mechanisms

Regarding this "calming effect," very little research has been conducted to help identify possible underlying mechanisms by which animals help reduce anxiety. Some researchers have proposed that animals provide a distraction from otherwise stressful events (Doe, 1998; Katcher et al., 1984a, 1984b) while Katcher et al. hypothesized that the presence of undisturbed living organisms, in an evolutionary sense, are a sign of safety (conversely, the flight of animals might indicate approaching danger). Therefore, the

presence of a calm animal may be interpreted as an indication of a nonthreatening environment.

However, another possible mechanism by which animals reduce anxiety may be the influence that touch plays in human-animal interaction (Bardill & Hutchinson, 1997; Jenkins, 1986). In one controlled experiment, researchers found that interacting with a dog tactually reduced blood pressure significantly more than other types of interaction (e.g., talking to, looking at; Vormbrock & Grossberg, 1988). Similarly, a case study by Eddy (1996) found that of various forms of interaction (e.g., watching, touching) with a pet snake, the subject showed the lowest heart rate and blood pressure while touching the snake. Other studies have also indicated that touch may be an integral component of relaxation as well as other beneficial health outcomes (Field, 1998; Field, Hernandez-Reif, Quintino, Schanberg, & Kuhn, 1998; Field, Henteleff et al., 1998; Field et al., 1997; Gagne & Toye, 1994; Schachner, Field, Hernandez-Reif, Duarte, & Krasnegor, 1998). For sexually abused children and adolescents, the provision of nonsexualized touch is particularly important (Wells et al., 1997).

Animals and Depression

In addition to reducing stress and anxiety, animals have also been shown to reduce symptoms of depression (Stawar, 2000). Fritz, Farver, Hart, and Kass (1996) found that companion animals were associated with lower rates of depression among Alzheimer patient caregivers as compared to caregivers without pets. In a college sample, AAT was associated with reductions in depressive symptoms in the experimental group (Folse et al.,

1994). Similar findings resulted from AAT provided for nursing home residents diagnosed with clinical depression (Brickel, 1984).

Related to a reduction in depression, other authors have noted that AAT seemed to reduce *despair* in groups such as terminal cancer patients (Muschel, 1984) and Alzheimer's patients (Kongable et al., 1990). Several clinicians have also observed that animals seem to increase playfulness among clients (Banman, 1995; Mallon, 1994a; Muschel, 1984; Reichert, 1994; Siegel, 1993) who seem generally happier in their presence (Smith, 1983).

Child Abuse and Animal-Assisted Therapy

Findings that suggest that animals and AAT serve to reduce stress and anxiety as well as depression are particularly important with regard to victims of child maltreatment. As noted earlier, depression and anxiety are two common areas of symptomatology identified in the abuse literature. Granting the early developmental period in which the field of AAT finds itself, very little empirical research to date has made this important connection. It, therefore, seems imperative to research the potential changes in symptomatology associated with AAT in a group of child maltreatment victims.

As such, the following two hypotheses will be addressed by this research.

1. Would the addition of AAT to conventional psychotherapy be associated with significantly greater reductions in mean depression, state anxiety and behavioral problems scores than mean scores associated with conventional therapy only after nine weeks of treatment?

2. Would AAT be associated with significant reductions in mean depression and state anxiety scores between weekly pre- and posttests?

At three time points (i.e., week 1, week 5, and week 9) over the course of 9 weeks, youths 11-17 years of age completed the Beck Depression Inventory II, a brief version of the Beck Depression Inventory II, the State-Trait Anxiety Inventory, and the Youth Self-Report, while residential treatment facility staff completed the Youth Outcome Questionnaire. Both the control and treatment groups completed the assessments at the three time points, and the treatment group, receiving the AAT, in addition to conventional psychotherapy, also completed depression and state anxiety assessments before and after a 1-hour AAT intervention.

CHAPTER III

METHODS

This study was designed to address some of the identified shortcomings of evaluation studies in the current field of AAT by focusing on a population frequently suffering from symptoms that research suggests are reduced by exposure to AAT. Specifically, it explored changes in anxiety and depression symptomatology as well as behavioral changes associated with exposure to AAT experienced by a sample of adolescent survivors of trauma.

Participants

The intended target population included all children and adolescents who have been exposed to child abuse and maltreatment, who seek intervention services, and whose caregivers consent to participation. Due to a lack of random selection, however, this research project included a small convenience sample of adolescents with child abuse and neglect histories receiving psychological services while living in a residential treatment facility in Sonoma County, California. The two groups were as follows: Group 1 (the treatment group), who received conventional psychotherapy as well as an AAT program called the "Forget Me Not Farm," and Group 2 (the control group), who received conventional psychotherapy only. For this study, conventional psychotherapy included weekly group therapy for all participants and individual therapy once per week. Participants were between the ages of 11-17 years. A total sample size of 21 was

assessed, including 11 participants in the treatment group and 10 participants in the control group. Treatment group participants ranged in age from 11-15 years, with 5 males and 6 females. Control group participants ranged in age from 13-17 years, with 6 males and 4 females. Each participant was assessed over a 9-week time period, although many continued receiving therapy (either conventional or conventional plus AAT) after the data collection period.

Clinically, all participants were living in the residential treatment facility as the result of having been removed from their homes due to family violence. Although individual histories were not available in order to maintain confidentiality, these adolescents presumably suffered victimization severe enough to warrant the intervention of child protective services and placement in protective custody. Anecdotally and without identifying any specific youth, staff members noted that victimization included witnessing the murder of a parent, sexual abuse, and physical abuse requiring hospitalization.

For Group 1 (treatment), all adolescents aged 11-17, who were receiving treatment via the residential facility and who participated in the animal-assisted services of the Forget Me Not Farm (for whom consent and assent forms were signed and returned), were eligible to participate in the study. For Group 2 (control), all adolescents aged 11-17 who were receiving treatment via the residential facility (for whom consent and assent forms were signed and returned) were eligible to participate in the study. Adolescents in the control group were offered participation in the Forget Me Not Farm once all data were collected (i.e., wait-list control). See informed consent and assent documents in Appendix D. Participation was voluntary. This project was approved by the Institutional Review

Board at Utah State University. Twenty-six adolescents were eligible for participation in this study, although data from 5 participants was not usable due to subject attrition (i.e., early departure from True To Life Children's Services) or missing data.

At the residential facility, two female staff members involved with this study had master's degrees in social work and a male staff member had a bachelor's degree in social work. Both the female staff members had been employed at the facility for two or more years and the male staff member had been employed less than one year. All participating staff members were offered a stipend of $200 at the end of data collection.

Forget Me Not Farm

As mentioned above, the treatment group participated in AAT activities in addition to receiving conventional psychotherapy services. The Forget Me Not Farm is a collaborative effort between the Humane Society of Sonoma County, the San Francisco Child Abuse Council, and the YWCA of Sonoma County. This AAT program is one part of a two-part program, which also includes gardening. The charge of the Forget Me Not Farm is to "teach gentleness and nonviolence to at-risk children and families through gardening and animal care in a totally nonthreatening environment" (Rathmann, 1999, p. 393.) Further, Rathmann states that "the purpose of the...program is to provide children from violent homes the opportunity to become part of a nurturing series of relationships in which...animals grow into trusted companions to be cared for and played with, and adults grow into trusted and protective guides to the life cycle" (p. 405).

In a personal communication (April 12, 2001), Rathmann described the nature of techniques used to implement the therapeutic process with the animals. All children are introduced to the animals before being allowed to interact with them. This introduction usually involves issues around gentle touch and handling (teaching nurturing and empathy), safety, background on the breed, and its specific needs (e.g., dietary). Older children and adolescents may also receive instruction on more intimate features, such as care and grooming, feeding and cleaning. Social skills are addressed as children are taught appropriate interactions with the animals as well as training of some of the shelter dogs. After the introduction period, the staff members decide who is ready to interact with the animals directly; decisions are made based on the child's history and current status, taking into consideration safety concerns for both the child and animal. Rathmann stated that much of the time, the animal therapy is directed by the child, whose mood determines whether the time may be spent simply cuddling a bunny (e.g., to help recover from a chaotic home environment) or "anxiously pulling weeds, planting, or feeding the animals." The Forget Me Not Farm provides a group of temperament-tested farm animals (currently including a lamb, two pigs, a horse, a miniature donkey, one llama, two dwarf goats, a goose, rabbits, and occasionally cats/kittens, puppies, and an opossum). The program is offered for 1 hour on a weekly-basis.

Volunteers at the Forget Me Not Farm were trained by Rathmann in facilitating the AAT and in handling disclosures (as defined below) from participants. The researcher additionally trained the volunteers in using a Volunteer Observation Report form that clarified the nature of "disclosures" as any comment related to the adolescent's personal or

witnessed history of abuse or neglect. Depending on volunteer availability, some participants received one-on-one attention while interacting with the animals, some participants interacted in small groups with the animals, while being supervised by a staff person or volunteer, and other participants interacted with an animal or animals while being supervised from a distance. Therefore, the nature of the participants' interactions with the animals varied considerably.

Measures

To assess participants' responses to the AAT protocol, measures of depression and anxiety were collected, along with data on child behaviors and volunteer observations (see Appendix D).

Depression (Self-Report)

To measure depression, the Beck Depression Inventory-Second Edition (BDI-II; Beck, Steer, & Brown, 1996) was used. The BDI is a 21-item self-report instrument for measuring the severity of depression in adults and adolescents aged 13 years and older. Scores range from 0-63, with higher scores indicating more severe depression. This measure has been shown to have high internal consistency (coefficient alpha = .92), high test-retest stability (correlation = .93, $p < .001$, over one week), high construct validity (correlation between BDI-II and previous BDI-IA = .93, $p < .001$; Beck et al.), and the ability to differentiate between depressed and nondepressed participants (Richter, Werner, Heerlein, Kraus, & Sauer, 1998; Dozois, Dobson, & Arnberg, 1998).

The BDI-II manual (Beck et al., 1996) identified the following clinical cutoff scores for patients diagnosed with major depression: 0-13 = minimal, 14-19 = mild depression, 20-28 = moderate depression, 29-63 = severe depression.

Additionally, a brief version of the BDI-II (Beck et al., 1996) was created, referred to as the "brief Beck," composed of four critical items assessing sadness, self-criticalness, suicidal thoughts or wishes, and irritability. These critical items were used during the posttreatment assessments in an attempt to reduce subject apathy toward testing and to capture symptoms of depression most likely to be influenced by treatment intervention. It is important to note that these four items were purposefully chosen to capture unstable aspects of depression most likely to change over the course of one hour.

Anxiety (Self-Report)

To measure anxiety, the State-Trait Anxiety Inventory (STAI) was used for the participating adolescents. This instrument was developed for use with high school and college students and adults, but shown to be useful with junior high students (Spielberger, Edwards, Lushene, Montuori, & Platzek, 1973). The STAI is a 40-item, self-report, Likert scale instrument, containing two 20-item subscales measuring trait and state anxiety respectively. *Trait anxiety* is defined as a relatively stable personality characteristic of anxiety proneness, versus *state anxiety*, which is thought of as the transitory condition of perceived tension associated with certain stimuli (Spielberger et al., 1973). Scores on each subscale can range from 20-80, with higher scores reflecting greater levels of anxiety. Typically, internal consistency reliability of the STAI is high, with coefficients ranging

from .83-.92. Concurrent validity of the STAI with other measures of anxiety ranges from .75-.80.

The State-Trait Anxiety Inventory manual (Spielberger et al., 1973) offers percentile rankings normed on high school students to help interpret participants' scores. For example, a raw score of 58 on the state-portion of the assessment would place the subject in the 90th and above percentile; a trait score of 54 would yield the same percentile for participants.

Behavioral Problems (Self-Report)

The Youth Self-Report (YSR; Achenbach & Edelbrock, 1983) was used as a global inventory for identifying child problem behaviors. The YSR obtains child self-reports of competencies and behavioral/emotional problems. Youths provide information for items covering their activities, social relations, and school performance. The YSR has 20 competence items that also describe specific behavioral and emotional problems, plus open-ended responses to items covering physical problems, concerns, and strengths. Youths rate themselves for how true each item is now or was within the past six months using the following scale: 0 = not true; 1 = somewhat or sometimes true; 2 = very true or often true. The YSR has both broad and narrow band scales. The broad band scales include Internalizing, Externalizing, and Total Problems; the narrow band scales include: Aggressive behavior, Delinquent behavior, Withdrawn, Anxious/Depressed, Somatic complaints, Social problems, Thought problems, and Attention problems. The YSR has a fifth-grade readability level. It can be read to youths who have poor reading skills

(Achenbach & Edelbrock). The YSR has been shown to have good psychometric properties: one-week test-retest reliability range, r = .65-.83. The YSR manual (Achenbach & Edelbrock) identified total distress *T* scores in the range of 60-63 as "borderline clinical" and scores above 63 as "deviant."

Treatment Progress (Staff Report)

The Youth Outcome Questionnaire (YOQ; American Professional Credentialing Services, 1996) was used as a measure of treatment progress, specifically assessing the occurrence of observed behavior change. The YOQ consists of 64 items that comprise six separate subscales designed to tap several behavioral domains of children and adolescents aged 4-17 years, including items to identify increases in healthy behavior. The YOQ was completed on three occasions (e.g., week 1, week 5, and week 9) by three residential treatment facility staff members. One staff member completed all control group assessments and two staff members completed all treatment group assessments in order to track each child's progress. For the treatment group assessments, the same staff member rated the same child at each data collection point. Each item is rated on the following 5-point (0-4) Likert scale: never or almost never, rarely, sometimes, frequently, and almost always or always. The six subscales include intrapersonal distress, somatic, interpersonal relations, critical items, social problems, and behavioral dysfunction. The Total score reflects total distress in a child/adolescent's life. Higher total scores indicate greater disturbance in the individual. The YOQ takes about 5-7 minutes to complete.

The YOQ manual (American Professional Credentialing Services, 1996) identified a total cutoff score of 46 to discriminate between a community and clinical sample. The manual also offered a calculation for a "reliable change index" for the YOQ as 13 points, meaning that participants' total scores would need to "change by at least 13 points to be considered clinically significantly changed" (p. 7).

Behavioral Observations (Volunteers)

Volunteers at the Forget Me Not Farm were asked to make behavioral observations of the participants in Group 1. Observational notes were only made if the participant discussed any part of his/her victimization while in the presence of the animals. Observations were made on a checklist-style questionnaire created by the investigator with room for anecdotal comments. This questionnaire simply asked the volunteer to note whether or not an adolescent mentioned any aspect of his/her victimization while in the presence of the Farm animals and volunteers. See checklist in Appendix D.

Design and Procedure

As new adolescents were assigned to residential treatment at True To Life Children's Services (TLC), Andrew Day, program director, assessed each individual's appropriateness for inclusion in the study. Day made these assessments based on the individual's level of crisis and possible animal phobias. The names of individuals determined to be appropriate for the study were given to the TLC clinical social worker. For both groups, parents/guardians of adolescents aged 11-17 in True To Life Children's

Services, whose children were determined to be appropriate for the study, were asked to consent to voluntary participation of their children in the research study. Consent forms were presented and explained to parents/guardians by the TLC clinical social worker (see Appendix D). Twenty-six youths were approached regarding participation in this study. Of those approached, 100% consented/assented. For those interested, assent forms were presented to each adolescent by the social worker, with information detailing his/her role in the research process (which consisted of completing two self-report measures at week 1, week 5, and week 9, and one self-report during weeks 1 and 9 only). Only adolescents who presented in crisis or with extreme fear of animals were excluded from participation in the study.

A quasi-experimental design was used to determine the role that AAT played on participant characteristics, including depression, anxiety, and behavioral problems. Group membership was based on whether the adolescent was placed in the Level 12 facility (control group) or the Level 14 facility (treatment group). According to Day (personal communication, 2002), placement was based on several variables, principally including availability. Assessments were administered to the groups using the timetable in Table 1.

For the treatment group, all participants were administered each self-report measure (i.e., BDI, STAI, YSR) prior to attending the AAT program, to establish baseline rates of symptomatology. A research assistant administered all assessments. Assessments were completed on multiweek intervals to avoid participant apathy. After the final AAT session, all instruments were again administered (including the YSR). Volunteers

Table 1

Design Timetable

Time	Control group	Treatment group pre-AAT	Treatment group post-AAT
Week 1	BDI-II STAI YSR YOQ	BDI-II STAI YSR YOQ	brief Beck State only (STAI) Farm observations
Week 5	BDI-II STAI YSR YOQ	BDI-II STAI YOQ	brief Beck State only (STAI) Farm observations
Week 9	BDI-II STAI YOQ YSR	BDI-II STAI	brief Beck State only (STAI) YSR YOQ Farm observations

provided behavioral observations after each of the 3 AAT sessions as needed (e.g., if a child disclosed abuse).

Because the control group did not receive the additional intervention (i.e., AAT) during the data collection process, there was no need to administer the assessments on a pre/post basis (i.e., before and after each AAT session). To ensure confidentiality, the investigator did not know the identity of any participants because code numbers were used as identifying information on all instruments and documents. All data were collected by a social worker blind to the hypotheses.

CHAPTER IV

RESULTS

The results of this study are grouped into three subsections. First, descriptive information for both the control and treatment groups is provided. Reliability alphas will also be provided as indicators of the reliability of these measures with this sample. As provided in the Method section, clinical cut-off scores and category groupings exist for each instrument. The number of participants who fell into each grouping are identified to facilitate interpretation of the participant scores. Appendix C contains graphic depictions of the descriptive data for both groups (see Graphs 1-31). Second, correlations between the assessments are provided on all assessments, including the subscale scores. Third, multivariate statistics are provided showing the comparisons between the two groups on each of the assessments. A repeated measures analysis of variance is also presented showing within-group comparisons for each group on the assessments, including weekly pretest/posttest comparisons for the treatment group. Graphic depictions of paired samples *t* statistics for the BDI and the YSR for the control group and the STAI for the experimental group are provided in Appendix C.

Descriptive Statistics

The control group, with a sample size of 10, was comprised of 5 boys and 5 girls, ranging in age from 13-17 years. Mean scores for all assessments (i.e., BDI, STAI, YOQ, and the YSR) are listed in Table 2. Please note that both state anxiety and trait anxiety

scores were captured by the STAI, and referred to as "state" and "trait," respectively. The treatment group, with a sample size of 11, was comprised of 6 girls and 5 boys, ranging in age from 11-15 years. Mean scores for all assessments (e.g., BDI, brief Beck, STAI, YOQ, and the YSR) are also listed in Table 2.

Complete descriptive statistics, including minimum and maximum scores for the control and treatment groups can be found in Appendix B (Tables B1 and B2, respectively). Correlations between depression, anxiety, somatic complaints, and aggressive behavior subscales from the instruments can also be found in Appendix B (Tables B3, B4, B5, and B6, respectively; see subscale correlations section for description).

It is important to note that the coefficient alphas computed for the Brief Beck depression inventory were quite low, suggesting questionable reliability for this instrument. As such, interpretation of results related to the brief Beck should be considered exploratory at best and viewed with caution.

Item-total correlations were calculated to determine if certain questions might be affecting the internal consistency coefficients more than others (see Table 3). Coefficient alphas were computed for each assessment and are also presented in Table 3. Item-total correlation calculations were as follows: (a) question 1 + question 2 + question 3, alpha = .60; (b) question 1 + question 3 + question 4, alpha = .46; (c) question 2 + question 3 + question 4, alpha = .65; and (d) question 1 + question 2 + question 4 alpha = .58; where question 1 concerned sadness, question 2 concerned self-criticalness, question 3 concerned suicidal thoughts or wishes, and question 4 concerned irritability.

Table 2

Descriptive Statistics

Time	Assessment	Control mean	Control median	Control std. deviation	Treatment mean	Treatment median	Treatment std. Deviation
Week 1	BECK pre-AAT*	17.30	18.0	12.46	11.27	10.0	9.49
	brief BECK pre-AAT	3.30	4.50	2.54	1.55	1.0	1.75
	brief BECK post-AAT	NA	NA	NA	1.18	.91	3.06
	STATE pre-AAT	54.50	58.0	9.38	36.64	30.0	13.48
	STATE post-AAT	NA	NA	NA	24.82	23.0	6.59
	TRAIT	55.60	54.5	10.02	40.82	43.0	11.76
	YSR	58.80	55.5	12.73	56.18	53.0	9.95
	YOQ	79.20	89.0	27.82	64.18	60.0	22.28
Week 5	BECK pre-AAT	17.10	12.5	16.09	7.64	3.0	7.61
	brief BECK pre-AAT	3.20	3.0	2.82	1.00	1.0	1.18
		NA	NA	NA	.27	.00	.65
	STATE pre-AAT	54.60	52.0	12.61	34.91	34.0	8.71
	STATE post-AAT	NA	NA	NA	27.55	23.0	9.82
	TRAIT	55.90	54.5	12.18	36.00	35.0	8.40
	YOQ	76.20	71.0	34.51	66.91	66.0	24.75
	YSR	59.20	53.5	15.27	NA	NA	NA
Week 9	BECK pre-AAT	11.80	5.0	14.14	11.36	4.0	16.76
	brief BECK pre-AAT	1.70	0.0	2.06	1.91	.00	3.78
	brief BECK post-AAT	NA	NA	NA	.82	.00	1.54
	STATE pre-AAT	56.80	5.6.0	11.75	40.91	41.0	16.35
	STATE post-AAT	NA	NA	NA	29.00	27.0	11.69
	TRAIT	55.50	55.5	11.56	38.45	38.0	11.58
	YSR	53.70	48.5	13.56	56.18	56.0	8.39
	YOQ	75.30	83.5	34.44	74.09	69.0	25.87

Note. Control group scores are identified here as "pre-AAT" for simplicity sake; they did not receive the AAT and therefore, have no pre- or posttest scores. BECK = Beck Depression Inventory II; Brief Beck = four critical items from the Beck Depression Inventory II; STATE = State portion of the State-Trait Anxiety Inventory; TRAIT = Trait portion of the State-Trait Anxiety Inventory; YSR = Youth Self-Report; YOQ = Youth Outcome Questionnaire.

Table 3

Internal Consistency Coefficients

Assessments	Control group	Treatment group
Beck Depression Inventory II	.92	.93
Brief Beck	.58	.63
State-Trait Anxiety Inventory	.94	.96
Youth Self-Report	.94	.94
Youth Outcome Questionnaire	.95	.95

Categorical Grouping of Participants Based on Clinical Cut-Off Scores

This section provides tables (Tables 4, 5, 6, 7, and 8) indicating where individual subject's scores fell in terms of normative data for the four assessments (note that the STAI is presented in separate state and trait anxiety tables), helping to determine the clinical make-up of both groups.

For the treatment group, participants completed the BDI II prior to receiving the AAT. Note that both groups primarily remained in the minimally to mildly depressed range (0 - 19) throughout the data collection period.

Note that the control group scores for the STAI remained primarily within the 80th-90th and the 90th and above percentiles while the treatment group scores remained primarily below the 80th percentile. Specifically, the "< 80th percentile" category broke down as follows for the treatment group: week 1 pre (20th percentile = 5, 30th = 2, 50th = 1), week 1 post (20th percentile = 9, 30th = 1, 60th = 1), week 5 pre (< 20th percentile =

Table 4

Beck Depression Inventory II, Number of Individuals

Clinical cut-off scores	Control week 1	Control week 5	Control week 9	Treatment week 1	Treatment week 5	Treatment week 9
0-13 minimal	3	5	7	8	8	8
14-19 mild depression	3	2	0	2	2	1
20-28 moderate depression	2	1	1	0	1	1
29-63 severe depression	2	2	2	1	0	1

Table 5

State Anxiety, Number of Individuals

	Control			Treatment					
Percentile	week 1	week 5	week 9	week 1 pre	week 1 post	week 5 pre	week 5 post	week 9 pre	week 9 post
< 80th	2	3	2	8	11	10	11	8	10
80th-90th	1	2	2	2	0	0	0	1	0
90th	7	5	6	2	0	1	0	2	1

Table 6

Trait Anxiety, Number of Individuals

Percentile	Control week 1	Control week 5	Control week 9	Treatment week 1	Treatment week 5	Treatment week 9
80th	1	3	3	8	9	9
80-90th	3	1	0	2	2	1
> 90th	6	6	7	1	0	1
	(1) 40th	(1) 30th (2) 70th	(1) 30th (2) 70th	(2) 10th (1) 20th (1) 30th (1) 40th (3) 60th	(2) 10th (3) 20th (1) 30th (2) 40th (1) 60th	(2) 10th (2) 20th (2) 30th (2) 40th (1) 60th

Table 7

Youth Self-Report, Number of Individuals

Clinical cut-off scores	Control week 1	Control week 5	Control week 9	Treatment week 1	Treatment week 9
59 or below nonclinical	6	6	7	6	7
60-63 nonclinical	1	1	0	3	3
64+ deviant	3	3	3	2	1

Note. Given the length of the 112-question YSR, treatment group participants only completed this assessment at weeks 1 and 9.

Table 8
Youth Outcome Questionnaire, Number of Individuals

Clinical cut-off scores	Control week 1	Control week 5	Control week 9	Treatment week 1	Treatment week 5	Treatment week 9
46 community	1	2	2	2	4	1
+ 46 clinical	9	8	8	9	7	10

3, 30th = 5, 60th = 2), week 5 post (< 20th percentile = 8, 30th = 1, 60th = 2), week 9 pre (< 20th percentile = 3, 30th = 2, 30th = 2, 70th = 3), and week 9 post (< 20th percentile = 7, 30th = 2, and 60th = 1).

Note that given the more enduring nature of trait anxiety, participants in the treatment group were not asked to complete the trait anxiety portion of the STAI after receiving the AAT intervention. The control group scores generally fell within the 90th and above percentile for the duration of the data collection period, while the treatment group scores primarily fell below the 80th percentile. These data suggest existing differences in the two groups' level of distress at the start of the study.

Participants in both groups of the YSR generally reported symptoms below the clinical cutoff score, although several participant scores were in the deviant range.

According to residential treatment facility staff members, the majority of adolescent participants received ratings similar to ratings achieved by a clinical population of youths.

Subscale Correlations

Note that various subscales for the YSR and the YOQ overlapped with the BDI-II and the STAI as well as with each other in terms of providing measures of depression, anxiety, somatic complaints, and aggression. As such, correlations were generated for symptoms of depression as measured by the BDI-II, the brief Beck, the anxiety/depression subscale of the YSR, and the intrapersonal distress subscale of the YOQ. These correlations indicated significant relationships between the BDI and the brief Beck scores (r = .803), the BDI scores and the YSR anxiety/ depression subscale scores (r = .850), and between the brief Beck and the YSR anxiety/depression subscale scores (r = .843). The YOQ intrapersonal distress subscale scores did not correlate significantly with any other depression measure score. Symptoms of anxiety were correlated using scores on the STAI, the anxiety/depression subscale of the YSR, and the intrapersonal distress subscale of the YOQ. These correlations indicated significant relationships between state and trait anxiety scores (r = .876), state anxiety scores and the anxiety/depression subscale of the YSR (r = .628), and trait anxiety scores and the anxiety/depression subscale of the YSR (r = .710). Again, scores on the YOQ intrapersonal distress subscale did not significantly correlate with any other anxiety scores. Somatic complaints were correlated using scores on the somatic subscale of the YSR and the somatic subscale of the YOQ. These correlations indicated no relationship between these two subscales. Aggressive behavior was correlated using scores on the aggressive behavior subscale of the YSR and the social problems subscale of the YOQ. These correlations indicated a moderate relationship

between these two subscales (r = .486). Subscale correlations can be found in Appendix B.

Correlations

Correlations were computed as an assessment of potential redundancy between measures. See Table 9 for Pearson product moment correlations for the control group scores, Table 10 for treatment group correlations, and Table 11 for Pearson product moment correlations for all participants on week 1 assessments, using treatment group pre-AAT scores in order to avoid any potential treatment effect.

Table 9

Control Group, Week 1 Correlations

Assessments	Pearson correlation	Beck	State anxiety	Trait anxiety	YSR	YQR
Beck pre	Pearson correlation	1.000	.620	.469	.762	.033
			.056	.171	.010**	.929
State anxiety	Pearson correlation	.620	1.000	.819	.706	.377
		.056		.004**	.022*	.283
Trait anxiety	Pearson correlation	.469	.819	1.000	.751	.214
		.171	.004**		.012*	.552
YSR	Pearson correlation	.762	.706	.751	1.000	.038
		.010**	.022*	.012*		.917
YOQ	Pearson correlation	.033	.377	.214	.038	1.000
		.929	.283	.552	.917	

Note. Alpha set to .05.
* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 10

Treatment Group, Week 1 Pretest Correlations

Assessments	Pearson correlation	Beck pre	State pre	Trait anxiety	YSR	YQR
Beck pre	Pearson correlation	1.000	.630 .038*	.763 .006**	.728 .011*	.085 .804
State anxiety	Pearson correlation	.630 .038*	1.000	.808 .003**	.353 .286	.001 .999
Trait anxiety	Pearson correlation	.763 .006**	.808 .003* *	1.000	.516 .105	.236 .484
YSR	Pearson correlation	.728 .011*	.353 .286	.516 .105	1.000	.484 .132
YOQ	Pearson correlation	.085 .804	.001 .999	.236 .484	.484 .132	1.000

Note. Alpha set to .05.
* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Correlations for All Participants Combined

As identified in the correlation matrices, substantial relationships exist between the variables, most notably between the BDI, the STAI, and the YSR, all self-report instruments completed by the participants. Perhaps as noteworthy, none of the assessments correlated significantly at any point in time with the YOQ, a staff report of behavioral concerns. Given the substantial correlations among the self-report instruments, it was determined to drop scores from the YSR and the trait anxiety scores of the STAI

Table 11

Week 1, Correlations for All 21 Participants

Assess-ments	Statistics	Beck pre	Brief Beck pre	State pre	Trait anxiety	YSR	YQR
Beck pre	Pearson correlation	1.000	.782**	.578**	.587**	.754**	.127
	Sig. (2-tailed)		.000	.006	.005	.000	.583
	N	21	21	21	21	21	21
Brief Beck pre	Pearson correlation	.782**	1.000	.643**	.740**	.681**	.093
	Sig. (2-tailed)	.000		.002	.000	.001	.688
	N	21	21	21	21	21	21
State anxiety	Pearson correlation	.578**	.643**	1.000	.876**	.453*	.306
	Sig. (2-tailed)	.006	.002		.000	.039	.177
	N	21	21	21	21	21	21
Trait anxiety	Pearson correlation	.587**	.740**	.876**	1.000	.571**	.346
	Sig. (2-tailed)	.005	.000	.000		.007	.125
	N	21	21	21	21	21	21
YSR	Pearson correlation	.754**	.681**	.453*	.571**	1.000	.245
	Sig. (2-tailed)	.000	.001	.039	.007		.284
	N	21	21	21	21	21	21
YOQ	Pearson correlation	.127	.093	.306	.346	.245	1.000
	Sig. (2-tailed)	.583	.688	.177	.125	.284	
	N	21	21	21	21	21	21

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

from the between-group analyses in an effort to increase power to detect differences and still address the original hypotheses. Thus, between-group analyses utilized only the BDI, the brief Beck, the state anxiety scores of the STAI, and the YOQ.

Between-Group Analyses

A multivariate analysis of variance (MANOVA) was conducted to compare control and treatment group scores on the depression, state anxiety, and staff-rated behavior problems assessments as noted above. One hypothesis tested was that the treatment group, receiving the AAT as an additional intervention, would show

significantly greater reductions in mean self-reported depression and state anxiety, and observer-reported behavioral problems as compared to the control group, receiving conventional psychotherapeutic intervention only. Instruments used to assess these differences included the BDI-II and a brief version of the BDI, the STAI, and the YOQ, respectively (see design timeline previously discussed).

The next section first describes analyses conducted to detect any pretreatment group mean differences, and then reports on between-group differences on each of the four assessment scores. Note that after the initial analyses to determine pretreatment differences were computed, the between-group analyses were conducted using the control group's single weekly scores as compared to the treatment group's post-AAT scores for the brief Beck and the state portion of the State-Trait Anxiety Inventory. This was done to better assess for the role that the Animal-Assisted Therapy played in symptom reduction. In order to compare depression scores, control participants' BDI-II scores were converted to "brief Beck" scores by using only the critical items as used on the brief Beck instrument. On the YOQ, scores were simply compared week-to-week.

Pretreatment Analyses

Initial analyses compared the groups' means at week 1 using the treatment group's pretest scores to determine whether significant differences existed between the groups prior to the treatment group receiving the adjunctive AAT. A one-way MANOVA was conducted to determine the effect of the group on the three week 1 dependent variables: the brief Beck depression inventory, state anxiety scores from the STAI, and the YOQ. Significant differences were found between the groups on the dependent measures, Wilks'

Lamba = .596, F (3, 17) = 3.835, p = .029, eta squared = .404. See Table 12 for actual mean scores and Table 13 for the complete MANOVA statistics.

Follow-Up Tests

Analyses of variance (ANOVA) on each dependent variables were conducted as follow-up tests to the MANOVA. Using the Bonferroni method, each ANOVA was tested at the .02 level (.05/3). The ANOVA on the pretreatment state anxiety scores was significant, F (1, 19) = 12.173, p = .002, eta squared = .390. The ANOVA on the brief Beck was nonsignificant, F (1, 19) = 3.449, p = .079, eta squared = .154, as was the ANOVA on the YOQ, F (1, 19) = 1.882, p = .186, eta squared = .09. See Table 14 for complete ANOVA statistics.

Given this pretest difference on state anxiety scores, an analysis of covariance (ANCOVA) was considered in order to adjust posttest means for initial differences found on the pretest and thereby reduce possible systematic bias (Stevens, 1999).

Prior to conducting the ANCOVA, the homogeneity-of-slopes assumption was tested to evaluate the interaction between the covariate and the factor in predicting the state anxiety score. For this analysis, the week 1 pretest mean state anxiety scores were used as the covariate, the week 5 posttest mean state anxiety scores were used as the dependent variable and group (treatment, control) was used as the fixed factor. As seen in Table 15, there is a significant group x covariate interaction, F(2, 18) = 40.554, p = .000, eta squared = .818, indicating that one could not asume homogeneity of slopes and therefore, an ANCOVA was not an appropriate follow-up analysis.

Table 12

Mean Group Scores for Week 1 Assessments

Group	Descriptive statistics	Brief Beck pre	State pre	YOQ
Control	Mean	3.30	54.50	79.20
	Std. deviation	2.54	9.38	27.82
Treatment	Mean	1.55	36.64	64.18
	Std. deviation	1.75	13.48	22.28
Total	Mean	2.38	45.14	71.33
	Std. deviation	2.29	14.63	25.60
	Cohen's *d*	.8	1.5	.6

Table 13

Pretreatment Between-Group Multivariate[b] Analayses of Variance

Effect	Value	*F*	Hypothesis *df*	Error *df*	Sig.	Eta Squared
Intercept						
Pillal's Trace	.959	132.163[a]	3.000	17.000	.000	.959
Wilks' Lambda	.041	132.163[a]	3.000	17.000	.000	.959
Hotelling's Trace	23.323	132.163[a]	3.000	17.000	.000	.959
Roy's Largest Root	23.323	132.163[a]	3.000	17.000	.000	.959
Group						
Pillal's Trace	.404	3.835[a]	3.000	17.000	.029	.404
Wilksk' Lambda	.596	3.835[a]	3.000	17.000	.029	.404
Hotelling's Trace	.677	3.835[a]	3.000	17.000	.029	.404
Roy's Largest Root	.677	3.835[a]	3.000	17.000	.029	.404

[a] Exact statistic.
[b] Design: Intercept + Group.

Table 14

Pretreatment Between-Group Analyses of Variance

Source	Dependent variables (week 1)	Type III sum of squares	*df*	Mean square	*F*	Sig.	Eta squared
Corrected model	brief Beck pre	16.125[a]	1	16.126	3.449	.079	.154
	State pre	1671.526[b]	1	1671.526	12.173	.002	.390
	YOQ	1181.430[c]	1	1181.430	1.882	.186	.090
Inercept	brief Beck pre	122.982	1	122.982	26.306	.000	.581
	State pre	43506.764	1	43506.674	316.832	.000	.943
	YOQ	107686.573	1	107686.573	171.544	.000	.900
Group	brief Beck pre	16.125	1	16.128	3.449	.079	.154
	State pre	1671.526	1	1671.526	12.13	.002	.390
	YOQ	1181.430	1	1181.430	1.882	.186	.090
Error	brief Beck pre	88.827	19	4.675			
	State pre	2609.045	19	137.318			
	YOQ	11927.236	19	627.749			
Total	brief Beck pre	224.000	21				
	State pre	47076.000	21				
	YOQ	119966.000	21				
Corrected total	brief Beck pre	104.952	20				
	State pre	4280.571	20				
	YOQ	13108.667	20				

[a] R squared = .154 (Adjusted R Squared = .109)
[b] R squared = .390 (Adjusted R Squared = .358)
[c] R squared = .090 (Adjusted R Squared = .042)

At the suggestion of Kerstin Schroder, Ph.D., Utah State University Psychology Department faculty (personal communiqué, July 14, 2004), a repeated measures ANOVA using week 1 mean pretest state anxiety scores, week 5 mean posttest state anxiety scores, and week 9 mean posttest state anxiety scores, was conducted as a follow-up test. As seen in Table 16, the time-by-group interaction was not significant, $F(2, 18) = 3.427$, $p = .055$, eta squared = .276, suggesting no significant treatment effect.

Table 15

Assumption of Homogeneity of Slopes Analysis

Source	Type II sum of squares	*df*	Mean square	*F*	Sig.	Eta squared
Corrected model	5097.800[a]	2	2548.900	40.55	.000	.818
Intercept	58.295	1	58.295	4	.348	.049
Group +	5097.800	2	2548.900	.927	.000	.818
W1STATEA	1131.343	18	62.852	40.55		
Error	40553.000	21		4		
Total	6229.143	20				
Corrected total						

[a] R Squared = .818 (Adjusted R Squared = .798)

Table 16

Repeated Measures Analysis of Variance for State Anxiety

Effect	Value	*F*	Hypothesis *df*	Error *df*	Sig.	Eta squared
Time						
Pillal's Trace	.225	.2605[a]	2.000	18.000	.101	.225
Wilks' Lambda	.775	.2605[a]	2.000	18.000	.101	.225
Hotelling's Trace	.289	.2605[a]	2.000	18.000	.101	.225
Roy's Largest Root	.289	.2605[a]	2.000	18.000	.101	.225
Time + Group						
Pillal's Trace	.276	3.427[a]	2.000	18.000	.055	.276
Wilks' Lambda	.724	3.427[a]	2.000	18.000	.055	.276
Hotelling's Trace	.381	3.427[a]	2.000	18.000	.055	.276
Roy's Largest Root	.381	3.427[a]	2.000	18.000	.055	.276

[a] Exact statistic.
[b] Design: Intercept + Group; Within Subjects Design: Time

Posttreatment Between-Group Analyses

A one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of group (control, treatment) on the four dependent variables of

interest from weeks 5 and 9 (i.e., posttest brief Beck depression inventory scores and mean YOQ scores). Note that the treatment group took a revised version of the BDI II, consisting of only critical items, after receiving the AAT intervention in an attempt to reduce subject apathy. This revised version, referred to here as the "brief Beck," consisted of four critical items assessing sadness, self-criticalness, suicidal thoughts or wishes, and irritability. Significant differences were found between the groups on the dependent measures, Wilks' Lamba = .493, F (4,16) = 4.106, p = .018, eta squared = .507. See Table 17 for the complete MANOVA calculations.

Analyses of variances (ANOVA) on each of the week 5 and week 9 dependent variables were docted as follow-up tests to the MANOVA. As noted earlier, only posttest scores were used in an attempt to better capture the role played by the introduction of the AAT. See Table 18 for complete calculations.

Using the Bonferroni method, each ANOVA seen in Table 18 was tested at the .008 level (.05/6). Analyses suggest that treatment group's mean week 5 post-AAT brief Beck scores were significantly lower than the mean control group scores at week 5: F (1, 19) =12.379, p = .002, eta squared = .395. The effect size noted here by eta squared, suggests a quite large effect using the following guidelines: .01 - small effect, .06 = medium effect, .14 - large effect (Green, Salkind, & Ake, 2000). All other comparisons were nonsignificant (see Table 18).

Analyses of variances (ANOVA) on each of the above week 5 and week 9 dependent variables were conducted as follow-up tests to the MANOVA. As noted earlier, only posttest scores were used in an attempt to better capture the role played by

Table 17

Posttreatment Between-Group Multivariate Analysis of Variance

Effect	Value	*F*	Hypothesis *df*	Error *df*	Sig.	Eta squared
Inercept						
Pillal's Trace	.897	34.855[a]	4.000	16.000	.000	.897
Wilks' Lambda	.103	34.855[a]	4.000	16.000	.000	.897
Hotelling's Trace	8.714	34.855[a]	4.000	16.000	.000	.897
Roy's Largest Root	8.714	34.855[a]	4.000	16.000	.000	.897
Group						
Pillal's Trace	.507	4.106[a]	4.000	16.000	.018	.507
Wilks' Lambda	.493	4.106[a]	4.000	16.000	.018	.507
Hotelling's Trace	1.027	4.106[a]	4.000	16.000	.018	.507
Roy's Largest Root	1.027	4.106[a]	4.000	16.000	.018	.507

[a] Exact statistic.
[b] Design: Intercept + Group

the introduction of the AAT. Please see Table 18 for complete calculations.

Summary

The between-group analyses suggest mixed support for the hypothesis regarding that role that AAT might play in reducing depression as the treatment group scores were significantly lower only during week 5. Unfortunately, due to identified pretreatment group differences, observed differences between mean state anxiety scores could not be associated with the addition of the AAT as statistical procedures suggested no treatment effect. Therefore, no support was found for the hypothesis regarding the role that AAT might play in reducing state anxiety. Finally, the hypotheses regarding the role that AAT might play in reducing staff ratings of behavioral problems were also not supported.

Table 18

Univariate ANOVAs for Weeks 5 and 9

Effect	Value	*F*	Hypothesis *df*	Error *df*	Sig.	Eta squared
Correced model						
W5 brief Beck pre	25.352[a]	1	25.352	5.627	.028	.228
W5 brief Beck post	47.716[b]	1	47.716	12.379	.002	.395
W9 brief Beck pre	.877[c]	1	.877	.091	.766	.005
W9 brief Beck post	2.435[d]	1	2.435	.721	.406	.037
W5 YOQ	601.749[e]	1	601.749	.604	.447	.031
W9 YOQ	7.658[f]	1	7.658	.008	.928	.000
Intercept						
W5 brief Beck pre	92.400	1	92.400	20.509	.000	.519
W5 brief Beck post	59.906	1	59.906	15.542	.001	.450
W9 brief Beck pre	60.877	1	60.877	6.306	.021	.249
W9 brief Beck post	28.149	1	28.149	8.339	.009	.305
W5 YOQ	101324.416	1	101324.416	101.739	.000	.843
W9 YOQ	116901.943	1	116901.943	127.879	.000	.871
Group						
W5 brief Beck pre	25.352	1	25.352	5.627	.028	.228
W5 brief Beck post	47.716	1	47.716	12.379	.002	.395
W9 brief Beck pre	.877	1	.877	.091	.766	.005
W9 brief Beck post	2.435	1	2.435	.721	.406	.037
W5 YOQ	601.749	1	601.749	.604	.447	.031
W9 YOQ	7.658	1	7.658	.008	.928	.000
Error						
W5 brief Beck pre	85.600	19	4.505			
W5 brief Beck post	73.236	19	3.855			
W9 brief Beck pre	183.409	19	9.653			
W9 brief Beck post	64.136	19	3.376			
W5 YOQ	18922.536	19	995.923			
W9 YOQ	17369.009	19	914.158			
Total						
W5 brief Beck pre	199.000	21				
W5 brief Beck post	176.000	21				
W9 brief Beck pre	246.000	21				
W9 brief Beck post	94.000	21				
W5 YOQ	120335.000	21				
W9 YOQ	134454.000	21				
Corrected total						
W5 brief Beck pre	110.952	20				
W5 brief Beck post	120.952	20				
W9 brief Beck pre	184.286	20				
W9 brief Beck post	66.571	20				
W5 YOQ	19524.286	20				
W9 YOQ	17376.667	20				

[a] R Squared = .228 (Adjusted R Squared = .188). [b] R Squared = .395 (Adjusted R Squared = .363). [c] R Squared = .005 (Adjusted R Squared = -.048). [d] R Squared = .037 (Adjusted R Squared = -.014). [e] R Squared = .031 (Adjusted R Squared = -.020). [f] R Squared = .000 (Adjusted R Squared = -.052).

Within-Group Comparisons

Within-group comparisons were conducted to determine whether reductions in symptomatology occurred.

Control Group

A repeated measures analysis of variance was conducted to examine potential patterns of change for each subject over the nine-week data collection period. Graphic depictions of each control subject's scores on all assessments over the course of the nine-week study can be seen in Appendix C.

Brief Beck Depression Inventory

A repeated measures of analysis of variance revealed that the control group experienced a significant decrease in depression scores over the nine weeks as measured by the brief Beck depression inventory, $F(2, 8) = 6.798$, $p = .019$. Paired samples t statistics indicate that significant decreases occurred between the following time points: week 1 and week 9, $t = 2.808$, $p = .02$, as well as between week 5 and week 9, $t = 3.03$, $p = .014$.

Youth Self-Report (YSR)

Analyses suggest that the control group experienced a significant decrease in psychological distress and problem behaviors as measured by the YSR, $F(2, 8) = 11.771$, $p = .004$. Paired samples t statistics indicate that significant decreases occurred between the following time points: week 1 and week 9, $t = 3.255$, $p = .01$, as well as between

week 5 and week 9, $t = 4.499$, $p = .001$. Graphically, these pairwise comparisons using the BDI and the YSR can be seen in Appendix C (Graphs 6 - 11).

State-Trait Anxiety Inventory (STAI)

No significant changes in state anxiety scores were found, Wilks' Lamba = .906, F (2, 8) = .416, $p = .673$ and no significant changes in trait anxiety were found, Wilks' Lamba = .996, F (2, 8) = .018, $p = .983$.

Youth Outcome Questionnaire (YOQ)

No significant changes over time were found on scores for the YOQ, Wilks' Lamba = .931, F (2, 8) = .296, $p = .751$.

Overall control group mean scores across the three data points for the BDI and the YSR can be seen in Appendic C (Graphs 12 and 13, respectively).

Treatment Group Data

A repeated measures analysis of variance yielded no significant changes over the course of the 9-week experimental period for any of the five assessment instruments for the treatment group. Using the Bonferroni method, each ANOVA was tested at the .01 alpha level (.05/5). :

1. brief Beck depression inventory, pre-AAT, F (2, 9) = .885, $p = .446$.
2. brief Beck depression inventory, post-AAT, F (2, 9) = 1.550, $p = .264$.
3. state anxiety, pre-AAT, F (2, 9) = 2.067, $p = .183$.
4. state anxiety, post-AAT, F (2, 9) = 2.399, $p = .146$.
5. YOQ, F (2, 9) = .752, $p = .499$.

Weekly Pre-AAT Versus Post-AAT Comparisons

One hypothesis tested was that the AAT intervention would be associated with reductions in mean depression and state-anxiety scores between weekly pre- and posttests as measured by the brief BDI and the state portion of the STAI, respectively.

Beck Depression Inventory (BDI-II), Brief Version

Using the critical items only for comparison, treatment group mean scores were significantly lower at posttesting during week 5 only ($t = 2.764$, $p = .02$).

State Anxiety (Part of the State-Trait Anxiety Inventory)

Paired samples *t*-statistics suggested significantly lower post-test mean scores at all three data collection points: week 1 ($t = 3.659$, $p = .004$), week 5 ($t = 4.222$, $p = .002$), and week 9 ($t = 2.647$, $p = .024$).

Overall, the hypothesis that AAT would be associated with reductions in acute symptoms of depression and state anxiety was supported, although significant changes in depression scores were only found during week 5 and should be interpreted with caution due to the possible confounding role played by repeated testing.

The data also suggest, however, that these treatment effects for state anxiety were not maintained between data collection points. Table 19 depicts mean participant state anxiety scores over the three data collection points.

Graphic depictions of each treatment subject's scores for each assessment at each of the three data collection time points can be seen in Appendix C (Graphs 14-20). Appendix C graphs (Graphs 21-27) graphically show treatment participants' mean scores

for each assessment over the nine-week experimental period and graphs included in Appendix C also (Graphs 28-31) depict treatment group pre-/posttest differences where significant differences were found.

Table 19

Treatment Group, Mean State Anxiety Scores (Standard Deviations)

Week	Pre-AAT		Post-AAT	
1	36.64	(13.48)	24.82	(6.59)
5	34.91	(8.71)	27.55	(9.82)
9	40.91	(16.35)	29.00	(11.69)

CHAPTER V

DISCUSSION

The purpose of this study was to explore the role that AAT might play when combined with conventional psychotherapy as an adjunctive intervention for treatment of child trauma as compared with conventional therapy alone for adolescents living in a residential treatment facility in northern California. As such, two hypotheses were addressed. First, would the addition of AAT to conventional therapy result in significantly greater reductions than conventional therapy alone in symptoms of depression, anxiety and personal distress as well as observer-reported behavior problems as measured by the BDI-II and a "brief" version of the BDI comprised of critical items only, the STAI, the YSR, and the YOQ, respectively? Second, would AAT be associated with acute (i.e., pre- to post-AAT session) reductions in depression and state anxiety as measured by the BDI-II and a "brief" version of the BDI and the state-portion of the STAI? Each hypothesis will be addressed in the following section with support or lack thereof suggested by the data analysis, possible interpretations, and implications.

Hypothesis 1

Between-subjects analyses utilizing a multivariate analysis of variance suggested mixed support for the hypothesis exploring the possible additive effect of AAT to conventional psychotherapy. The treatment group depression scores were found to be significantly lower than the control group scores, but only during week 5. One possible

explanation for such results is a "cohort effect" wherein some positive, yet temporary event took place in the treatment group setting which had an uplifting effect on the adolescents, was reflected in their responses on the BDI-II, and resulted in the treatment group reporting fewer negative symptoms at week 5 only. However, residential treatment staff members were contacted to determine if an environmental factor might have influenced these scores and no specific event was identified.

A second possible explanation for this week 5 group difference on depression might have to do with the fact that the control group was an intact group living in the residential treatment facility over the summer for a fixed period of time whereas the treatment group consisted of staggered-entry participants staying indefinitely. Perhaps the combination of five weeks of intense therapy and a structured living environment plus access to peers in various stages of health and recovery resulted in significantly greater reductions in depression for treatment group participants. In fact, Shiu (2001) found that in children with chronic illness, social support, especially peer support, played a more important role in determining whether a child would remain in school than the child's state of health or the effects of treatment.

A third possible explanation for the lack of greater support for reductions in depression is the use of a "brief" version of a valid and reliable instrument. In an attempt to reduce subject apathy, four critical items were taken from the full BDI-II and used to assess depression after the participants received the AAT. At this time, the impact on the data of the introduction of an abbreviated instrument with such marginal reliability (.58 for the control group, .63 for the treatment group) is unknown.

The hypothesis that the treatment group mean state anxiety scores would be associated with significant reductions between groups was not statistically supported. However, it is worth pointing out that when comparing the control group's weekly mean scores to the treatment group's post-AAT mean scores, the discrepancy was as great as 31 points (raw scores ranging from 56 – 25), the treatment group scores being considerably lower. This large a spread coincides with a reduction of approximately 80 percentage points, or moving from the 90th percentile to the 10th percentile for self-reported symptomatology.

Finally, these data do not provide support for the hypothesis that AAT would be associated with significantly greater reductions in mean scores on the YOQ and the YSR. Although the data suggest that the control group mean scores were significantly lower on the YSR between week 1 and week 9 (total scores ranged from 59 to 54) and the treatment group's scores remained the same (scores were 56 at both time points), both groups reported symptoms at just-below the borderline clinical range of 60. The control group participants' self-reports of psychological and behavioral improvement mirrored the staff reports of the adolescents (measured by the YOQ) in that both sets of observer scores decreased at each time point. However, it should be noted that while the adolescents rated themselves as below a clinical cutoff of 60, the staff rated the adolescents as significantly higher than the designated cutoff (mean YOQ score for the three time points equaled 77; clinical cutoff set at 46).

A similar discrepancy existed between the treatment group adolescents and staff members where participants rated themselves as below the set clinical cutoff score, but

staff rated them considerably above the set clinical cutoff score. However, a difference in identified progress was suggested by the treatment group data. Whereas the treatment group adolescents rated their personal distress as not changing over the two data collection points (week 1 and week 9), the staff rated them as moving toward more problematic behaviors. These trends were not statistically significant, however.

One possible explanation for the mostly nonsignificant changes in self- and other-reported changes toward improved psychological and behavioral functioning is variation in the perceived benefits of AAT. In a study exploring the role of AAT with children diagnosed with emotional and/or behavioral problems, Lieber (2003) found that the child participants rated the AAT therapy program more positively than their parents or teachers, and that between teachers, great variety existed in terms of ratings of child behavior improvements. Such variation in a small sample could possibly result in statistically insignificant change.

A second possible explanation is the fact that the treatment group participants were slightly younger than the control group participants. While the extent of any subject's previous experience receiving psychological services is unknown, perhaps intervening earlier in a person's life facilitates treatment efficacy (Fenske, Zalenski, Krantz, & McClannahan, 1985). Another benefit from early intervention may be reduced exposure to abusive others.

Related to the above possible explanation is the idea that despite the levels of presumed victimization, the majority of scores on the self-report instruments reflected low

levels of psychopathology. As such, it is possible that a "floor effect" occurred, reflecting the difficulty of low scores to move significantly lower even after an intervention.

Two additional possible explanations for the mostly nonsignificant ratings of behavioral changes are that gains associated with the AAT were not observable in the residential treatment facility and/or that new skills failed to generalize to participants' home environments (Lieber, 2003).

The findings from this study of mostly non-significant changes in psychological and behavioral functioning appear to be in contrast to those of Katcher and Wilkins (2000), who found that AAT was associated with significant reductions in youth total problem scores and externalizing scores as rated by teachers on the Achenbach's Teacher's Report Form (1991). Possible reasons for the discrepancies between these two sets of findings may include the use of different instruments (e.g., Achenbach's YSR and the YOQ versus Achenbach's Teacher's Report Form; Achenach, 1991) and different samples (e.g., youth presenting primarily with trauma issues versus attention-deficit/hyperactivity disorder). However, the most likely explanations for the different outcomes are the frequency and duration of the interventions. In this study, the participants engaged in AAT for one hour per week over the course of nine weeks. In the study by Katcher and Wilkins, youth aged 7-16, spent five hours per week with the animals over the course of six months. Importantly, Katcher and Wilkins initially found no change between the mean treatment and control group scores on total problems or externalizing problems when compared at three months. Therefore, it seems possible that nine weeks of intervention was not a

sufficient amount of time to capture meaningful symptom reduction in important areas of functioning.

Hypothesis 2

The second hypothesis tested whether AAT was associated with acute symptom reduction in depression and/or state anxiety as measured by the BDI-II, the "brief Beck," and the state-portion of the STAI. Recall that treatment group scores showed significant reductions in depression for week 5 only and state anxiety scores were significantly lower at all three time points after receiving the AAT. This state anxiety finding is consistent with early anecdotal observations of the "calming" effect of animals (e.g., Katcher et al., 1984), and the reduction in depression is consistent with research exploring the role of AAT with a college population (Folse et al., 1994).

The lack of statistically significant reductions in depression for weeks 1 and 9 are more perplexing and thus, more difficult to explain. Perhaps given the more enduring nature of depression and the fact that the BDI-II was designed to measure changes in depressive symptomatology over the course of two weeks (Beck et al., 1996), capturing change over a one-hour period was unlikely. Also, recalling that the majority of scores on the BDI-II fell within the "minimal" range of depression, it is possible that less severe psychopathology rendered changes in this construct less likely. This tentative explanation leaves the significant reduction found during week 5 somewhat anomalous. Finally, the findings for weeks 1 and 9 may be the result of inadequately measured reductions in

depression due to reliance on only the subset of critical items from the BDI-II, a subset with marginal reliability and limited symptom picture.

Qualitative Data

It should be noted, however, that anecdotal comments made by treatment participants while at the Forget Me Not Farm suggest effects that may or may not have been captured by the quantitative instruments used. For example, one subject told a Farm volunteer on week 5, "Animals make me happy. I get an energy boost from them." This subject went on to share how despite an initial fear of chickens, she had been able to pick up and hold a chicken during this visit. She told the volunteer that she believed animals helped people overcome fears and build self-confidence. This adolescent finally stated that she was "proud of herself" and asked for enough candy to take back to her peers so all could enjoy her accomplishment. Another participant also commented to the research assistant on feeling more "self-confident" after being able to "make the cat happy" while on his week 5 visit. The research assistant also noted on one subject's week 1 data sheet that while the subject made no eye contact during the pretesting, she made eye contact four times in 10 minutes after spending time with the therapy animals.

While completing his week 5 posttreatment assessments, one subject told the research assistant that he wished she would ask him how he felt while he was with the animals. He said that he felt "peaceful" while holding the lap dogs who "look up at you in sweetness…lick your ears…there's a connection as you look back. I respond in sweetness. It allows peacefulness." Another subject, at week 9 posttreatment, was

looking at photos of herself taken at the Farm. She commented that she thought she looked "better" when she was with an animal and stated, "If I were a model in a photo shoot, I would demand to have animals around!" Finally, one participant who was suffering from severe menstrual cramps during her week 9 pretest, came to the posttest session and stated that she physically felt better, which she seemed to attribute to spending time with the animals.

Limitations

Clearly, this study was not without limitations that should be taken into consideration for future research. First, a sample size of 21 is extremely small and created a substantial lack of power to detect differences. That said, it should be noted that it took just over two years to collect the treatment group data. Thus, data for larger clinical sample sizes could take considerable time to collect.

Another limitation to this study was the residential treatment facility itself. While under the same organizational umbrella, the participants came from two separate residences, which were technically classified at two different levels of care according to the State of California. The control group facility was a "Level 12" care facility and the treatment group facility was a "Level 14" care facility, which according to True To Life Children's Services program director, Andrew Day, was designed to indicate the level of severity of the adolescent's situation or mental health status. However, Mr. Day shared in a personal communication (2002) that in practice, the two facilities are the "same" and that youth are placed based on availability. Future studies should attempt to control for

the possible influence of varying therapeutic environments and this selection threat to validity (Shadish, Cook, & Campbell, 2002).

As in any study utilizing a test-retest design, some findings from this study might have been compromised by the nature of repeated measures analyses. More specifically, it is unclear whether the reductions seen in the treatment group anxiety scores were influenced simply by participants retaking the same instrument within approximately one hour of the initial testing. Regression toward the mean should also be considered as a possible explanation for some of this study's findings, especially considering the distribution of several of the raw scores for the instruments.

And, although this same trend was not seen in the week 1 or week 9 depression scores of the treatment group (i.e., no changes were found), an abbreviated version of the instrument was used at posttesting, which may have controlled for any test-retest effects. However, this change in instrumentation could itself be considered an additional threat to internal validity (Shadish et al., 2002).

Another limitation revolves around the Forget Me Not Farm and the animals present for the study. The Farm houses many different types of animals, including horses, pigs, goats, sheep, geese, and a llama, which were available for participant interaction. The participants were given the freedom to interact with any animal they chose while being supervised. Some adolescents moved from animal to animal each week, while others worked to build a relationship with one specific animal during each weekly visit. No information was gathered as to exactly how much time a participant spent with an animal, either observing, talking with, grooming, or petting. As such, there was great

variability in the stimulus value of the animals. In order to better assess for the role that therapy animals might play as therapeutic agents, future research might control for such variability by utilizing a single animal or breed of animal and seek to accurately identify the specific interactions with the animal.

Supporting Research Findings

The findings from this study, namely the association between AAT and reductions in anxiety, are fairly consistent with recent research suggesting an association between AAT and reductions in anxiety with youth, as will be discussed in detail below. However, it should be noted that since 2001, literature searches have yielded relatively few new articles, many of which are reviews. For example, using *PsycInfo*, the search term "animal-assisted" yielded two relevant experimental studies and "animal-facilitated" yielded zero articles. Similar searches using *Medline* and *PsycArticles* both yielded zero new articles.

Several articles, which were either reviews or attempted meta-analyses, highlighted the difficulties associated with conducting rigorous research in the area of AAT (see Barker, Best, Fredrickson, & Hunter, 2000; Dashnaw-Stiles, 2001; Lajoie, 2003; Schwartz & Patronek, 2002). For example, Barker et al. found consistent data collection difficult when working within a school's predetermined time blocks, which also limited random assignment, and animal handler availability. As such, they concluded that there was mixed support for the role played by AAT in increasing social skills in Lummi Nation Head Start participants. Other researchers have found basic logistical difficulties in

conducting an AAT study, including variation between handlers' approaches to the animals, slight changes in the therapeutic environment over time, and the impact of large versus small therapy animals, which resulted in no conclusions being drawn from the study (Schwartz & Patronek). In a meta-analysis of existing AAT studies since 1984, Dashnaw-Stiles found that many studies reported biased statistical conclusions, failed to use adequate control groups, or failed to acknowledge potential risks to participants and animals.

In a small sample of elementary school children, Lieber (2003) found that therapy animals helped to improve the participants' ability to cope with anxiety as rated by parents and teachers using the Achenbach Child Behavior Checklist and the Teacher's Report Form . In a related study, Barker, Pandurangi, and Best (2003) found that AAT was related to an 18% reduction (although nonsignificant) in adult patients' anxiety prior to receiving electroconvulsive therapy, with no significant reduction in depression.

Implications

Findings from this study suggest that the addition of AAT to conventional psychotherapeutic services offered within a residential treatment facility was associated with significant reductions in traumatized adolescents' self-reported feelings of acute anxiety. However, whether this finding is due to the treatment, to repeated testing, or to an unnamed variable remains unclear. If future research demonstrates that AAT is responsible for reductions in anxiety, given that symptoms of anxiety are one of the most prevalent diagnoses associated with child abuse and neglect (Gibb et al., 2003), then AAT

appears worth consideration as a low-cost, non-psychotropic intervention. This seems especially true when one considers the high correlation between symptoms of anxiety and depression, another commonly diagnosed disorder associated with childhood victimization (Barbe et al., 2004). Further, if AAT as an adjunctive therapy could reduce state anxiety in a sample of adolescents with histories of severe child maltreatment, it seems plausible that AAT should be explored as an intervention with less traumatized youth.

Conclusion

Generally, AAT appears to be associated with short-term reductions in anxiety in adolescent trauma survivors. And, although reductions in depression were found for the treatment group, these reductions were not significantly different from those experienced by the control group. Future research is needed to determine the explanatory mechanisms behind such findings and perhaps determine at what point in a survivor's recovery AAT is most efficacious. Are certain types of animals more likely to be related to positive outcomes and are these effects particular to specific human populations? Also, the impact on therapy animals and possible health effects of interacting with humans needs to be addressed more scientifically in order to maintain the welfare of adjunctive therapists (Beck & Katcher, 2003). Additionally, with established links between animal abuse and human violence (Ascione & Arkow, 1999), future research should attempt to identify possibly deleterious effects on some clients exposed to AAT, including posttraumatic stress responses such as nightmares, flashbacks, or dissociative episodes (Herman, 1997). And, as AAT programs become more common, such programs need to be assessed using

"appropriate methodology, including studies of moderate or long duration and especially multi-centered studies using comparable protocols" (Beck & Katcher, p. 85). Related to Beck and Katcher's suggestions, future studies need to start with matched or equivalent groups, especially focusing on level of pathology, and utilize assessment instruments with sufficient reliability and sensitivity.

At this juncture, continued research is needed to the replicate the findings of this study and better document the actual treatment contact as well as standardize the implementation of such treatment across participants as we continue building our knowledge of the therapeutic role animals may play in human-animal interactions.

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APPENDICES

Appendix A:

Literature Comparisons

Table A1

Effects of Child Sexual Abuse Noted in Reviews of the Literature

Symptoms	Browne & Finkelhor, 1987	Finkelhor, 1990	Rind & Tromovitch, 1997
Depression	X	X	X
Anxiety	X	X	X
Substance abuse	X	X	X
Anger	X	X	X
Suicide/suicidal ideation	X	X	X
Negative self-concept	X	X	X
Self-destructive behavior	X		X
Dissociation		X	X
PTSD		X	X

Appendix B:

Descriptive Statistics and Subscale Correlations

Table B1

Descriptive Statistics, Control Goup

Time and assessments	*N*	Minimum	Maximum	Mean	Median	Std. Deviation
Week 1 BECK	10	1	40	17.30	18.0	12.46
Week 1 brief BECK	10	0	6	3.30	4.5	2.54
Week 1 STATE	10	34	65	54.50	58.0	9.38
Week 1 TRAIT	10	35	74	55.60	45.5	10.02
Week 1 YSR	10	38	78	58.80	55.0	12.73
Week 1 YOQ	10	22	112	79.20	89.0	27.82
Week 5 BECK	10	0	50	17.10	2.5	16.09
Week 5brief BECK	10	0	8	3.20	3.0	2.82
Week 5 STATE	10	38	77	54.60	52.0	12.61
Week 5 TRAIT	10	35	80	55.90	54.5	12.18
Week 5 YSR	10	37	89	59.20	53.5	15.27
Week 5 YOQ	10	12	119	76.20	71.0	34.51
Week 9 BECK	10	0	36	11.80	5.0	14.14
Week 9 brief BECK	10	0	5	1.70	0.0	2.06
Week 9 STATE	10	34	76	56.80	56.0	11.75
Week 9 TRAIT	10	33	77	55.50	55.5	11.56
Week 9 YSR	10	37	78	53.70	48.5	13.56
Week 9 YOQ	10	9	119	75.30	83.5	34.44

Note. YSR = Youth Self-Report; YOQ = Youth Outcome Questionnaire; Trait =Trait portion of the State-Trait Anxiety Inventory; State = State portion of the State-Trait Anxiety Inventory; brief Beck = four critical items from the Beck Depression Inventory II; and AAT = Animal-Assisted Therapy.

Table B2

Descriptive Statistics, Treatment Group

Time and assessment	*N*	Minimum	Maximum	Mean	Median	Std. deviation
Week 1 Beck pre-Att	11	1	36	11.27	10.0	9.49
Week 1 brief Beck pre-ATT	11	0	6	1.55	1.0	1.75
Week 1 brief Beck post-ATT	11	0	10	1.18	0.0	3.06
Week 1 STATE pre-ATT	11	23	59	36.64	30.0	13.48
Week 1 STATE post-ATT	11	20	42	24.82	23.0	6.59
Week 1 TRAIT	11	23	63	40.82	43.0	11.76
Week 1 YSR	11	40	73	56.18	53.0	9.95
Week 1 YOQ	11	32	99	64.18	60.0	22.28
Week 5 Beck pre-AAT	11	0	20	7.65	3.0	7.61
Week 5 brief Beck pre-ATT	11	0	3	1.00	1.0	1.18

(*table continues*)

Time and assessment	*N*	Minimum	Maximum	Mean	Median	Std. deviation
Week 5 brief Beck post-ATT	11	0	2	.27	0.0	.65
Week 5 STATE pre-AAT	11	23	53	34.91	34.0	8.71
Week 5 STATE post-ATT	11	20	46	27.55	23.0	9.82
Week 5 TRAIT	11	26	50	36.00	35.0	8.40
Week 5 YOQ	11	36	11900	66.91	66.0	24.75
Week 9 Beck pre-ATT	11	0	55	11.36	4.0	16.76
Week 9 brief Beck pre-ATT	11	0	12	1.91	0.0	3.78
Week 9 brief Beck post-ATT	11	0	5	.82	0.0	1.54
Week 9 STATE pre-AAT	11	21	74	40.91	41.0	16.35
Week 9 STATE post-ATT	11	20	56	29.00	27.0	11.69
Week 9 TRAIT	11	23	61	38.45	38.0	11.58
Week 9 YSR	11	44	75	56.18	56.0	8.39

(*table continues*)

Time and assessment	*N*	Minimum	Maximum	Mean	Median	Std. deviation
Week 9 YOQ	11	30	119	74.09	69.0	25.87

Note. YSR = Youth Self-Report; YOQ = Youth Outcome Questionnaire; Trait =Trait portion of the State-Trait Anxiety Inventory; State = State portion of the State-Trait Anxiety Inventory; brief Beck = four critical items from the Beck Depression Inventory II; and AAT = Animal-Assisted Therapy.

Table B3

Subscale Correlations, Depressive Symptoms

Symptoms	Correlations	W1 Beck pre	W1 Brief Beck pre	W1 YSR anx/dep	W1 YOQ Intrapersonal distress
W1 Beck pre	Pearson correlation	1.000	.803**	.850**	.109
	Sig (2-5ailed)		.000	.000	.638
	N	21	21	21	21
W1 Brief Beck pre	Pearson correlation	.803**	1.000	.843**	.137
	Sig (2-5ailed)	.000		.000	.555
	N	21	21	21	21
W1 YSR anx/dep	Pearson correlation	.850**	.843**	1.000	.118
	Sig (2-5ailed)	.000	.000		.610
	N	21	21	21	21
W1 YOQ intrapersonal distress	Pearson correlation	.109	1.37	.118	1.000
	Sig (2-5ailed)	.638	.555	.610	
	N	21	21	21	21

**Correlation is significant at the 0.01 level (2-tailed).

Table B4

Subscale Correlations, Anxious Symptoms

Symptoms	Correlations	W1 STATE pre	W1 TRAIT	W1 YSR anx/dep	W1 YOQ intrapersonal distress
W1 STATE pre	Pearson correlation	1.000	.876	.628	.256
			.000**	.002**	.263
W1 TRAIT	Pearson correlation	.876	1.000	.710	.336
		.000**	.	.000**	.137
W1 YSR anx/dep	Pearson correlation	.628	.710	1.000	.118
W1 YOQ intrapersonal distress	Pearson correlation	.256	.336	.118	1.000
		.263	.137	.610	

** Correlation is significant at the 0.01 level (2-tailed).

Table B5

Subscale Correlations, Somatic Symptoms

Symptoms	Correlations	W1 YSR somatic	W1 YOQ somatic
W1 YSR somatic	Pearson correlation	1.000	.032
		.	.890
W1 YOQ somatic	Pearson correlation	.032	1.000
		.890	.

Table B6

Subscale Correlations, Aggressive Behaviors

Behaviors	Correlations	W1 YSR aggressive	W1 YOQ social problems
W1 YSR aggressive	Pearson correlation	1.000	.486
			.026*
W1 YOQ social problems	Pearson correlation	.486	1.000
		.026*	

* Correlation is significant at the 0.05 level (2-tailed).

Appendix C:

Graphs

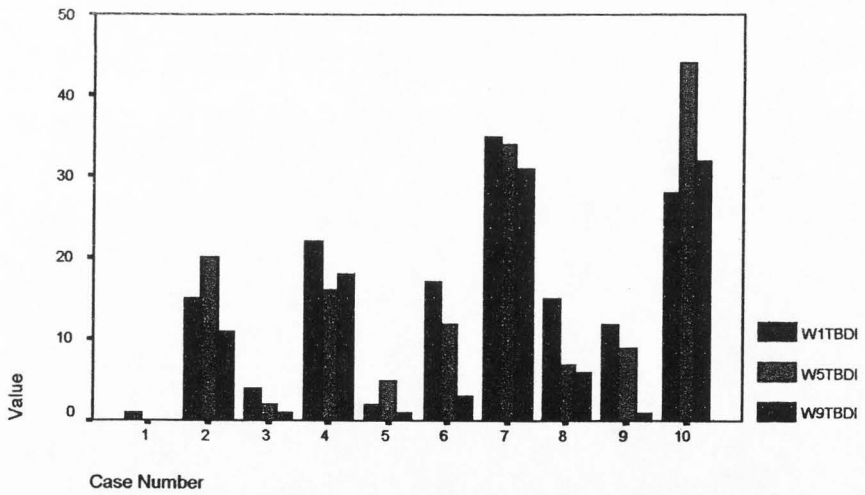
Graphs 1-5, Control Group, Individual Change Over Time

Graphic depictions of each control subject's scores over the course of the nine week study can be seen in Graphs 1-5, where Graph 1 indicates each subject's scores for the three time points on the Beck Depression Inventory, Graph 2 indicates scores for the "state only" portion of the State-Trait Anxiety Inventory, Graph 3 indicates scores for the "trait only" portion of the State-Trait Anxiety Inventory, Graph 4 indicates scores for the Youth Self-Report, and Graph 5 indicates scores for the Youth Outcome Questionnaire.

Graph 1

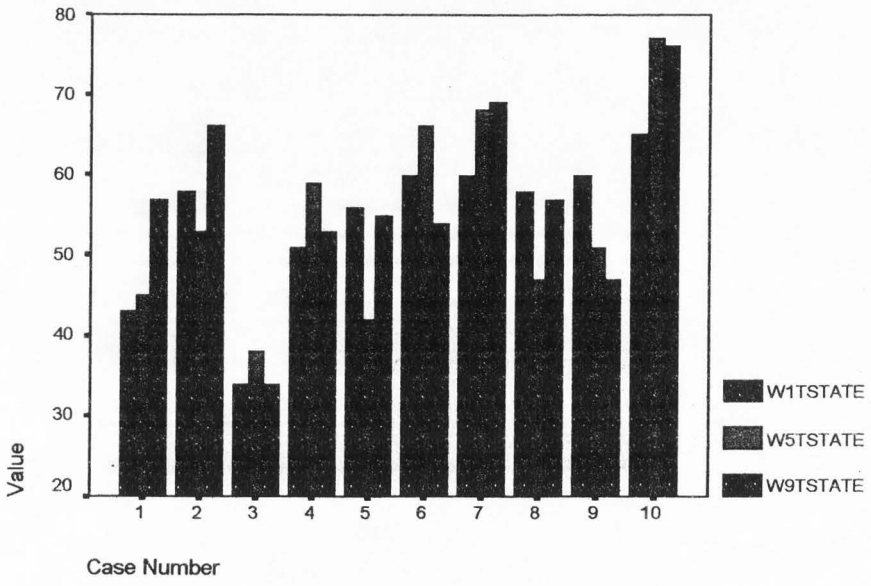
Control group, Beck Depression Inventory

Note. There are no missing data.



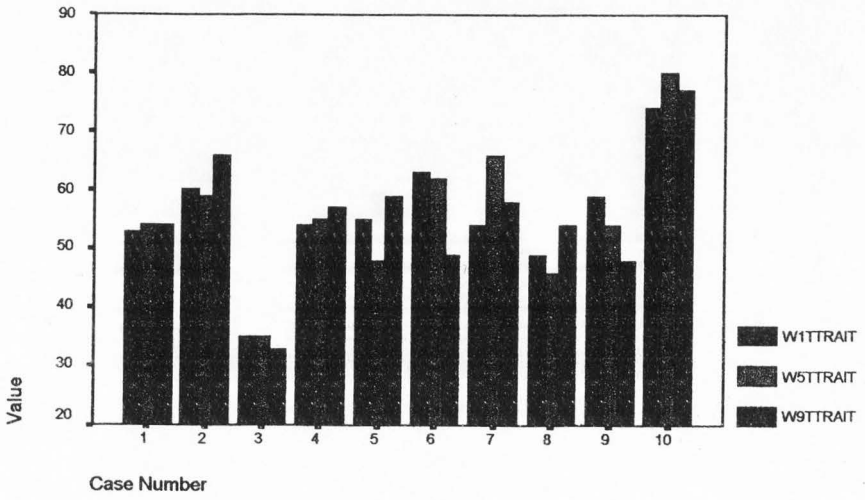
Graph 2

Control Group, State Only, State- Trait Anxiety Inventory



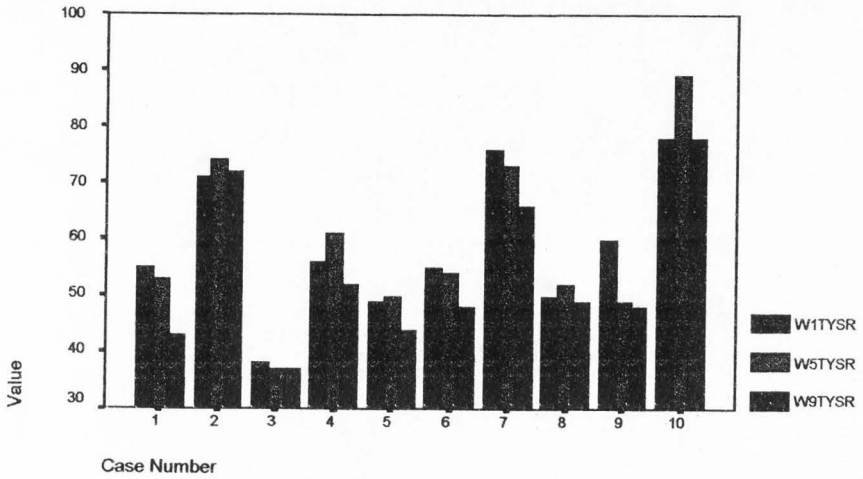
Graph 3

Control Group, Trait Only, State-Trait Anxiety Inventory



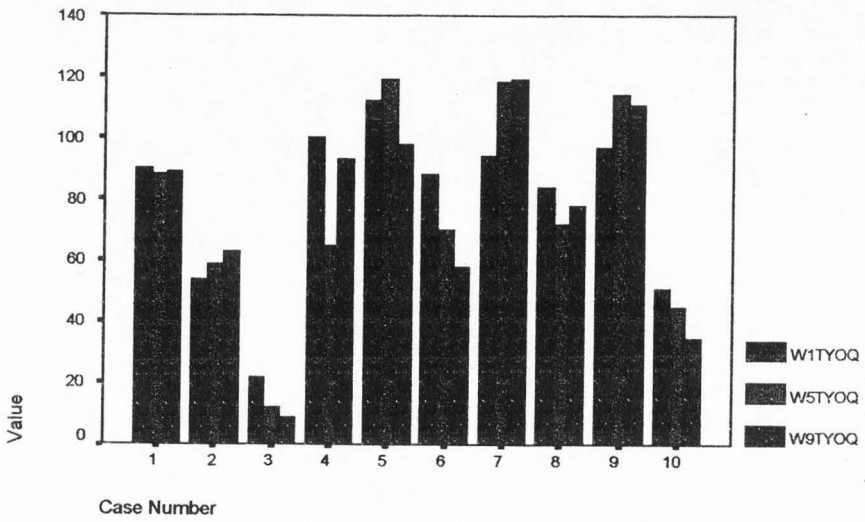
Graph 4

Control Group, Youth Self-Report



Graph 5

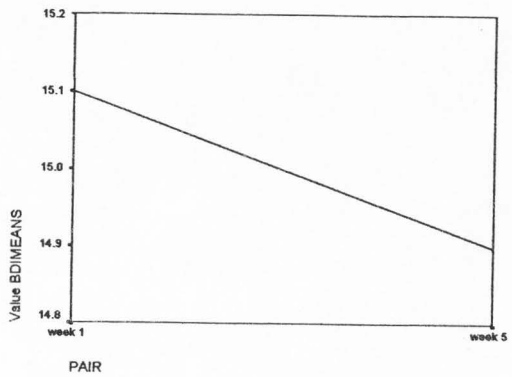
Control Group, Youth Outcome Questionnaire



Note. Variability on *X* axes reflects actual data.

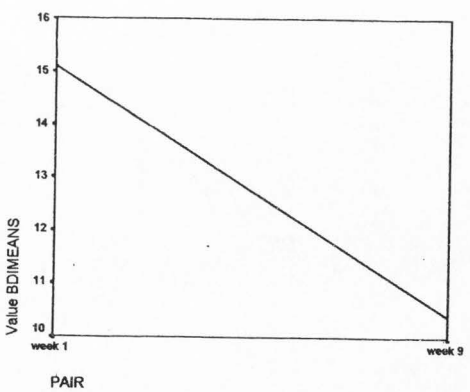
Graph 6

Control Ggroup, Beck Depression Inventory, Week 1 and Week 5, p = .929



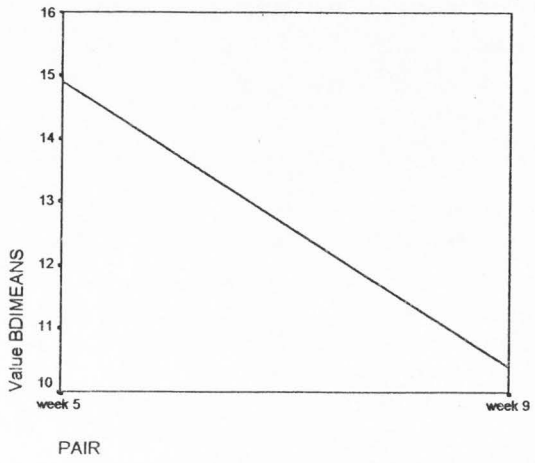
Graph 7

Control Group, Beck Depression Inventory, Week 1 and Week 9, p = .02



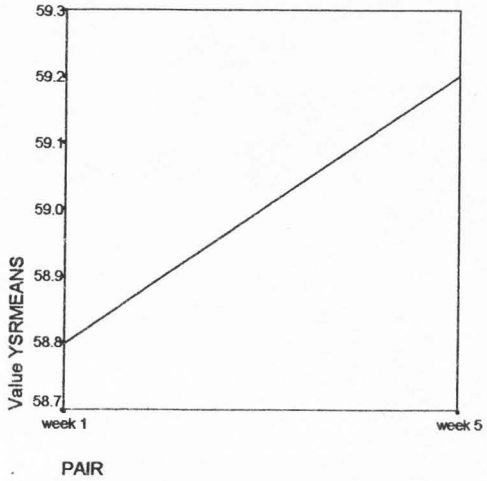
Graph 8

Control Group, Beck Depression Inventory, Week 5 and Week 9, p = .014



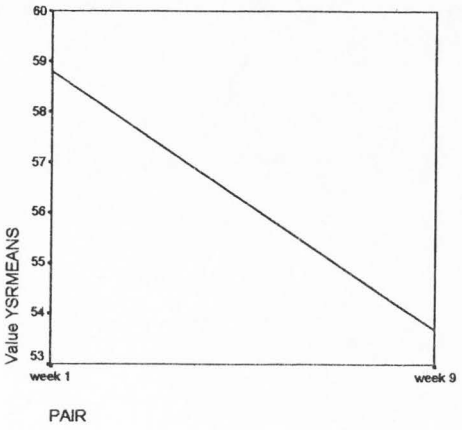
Graph 9

Control Group, Youth Self-Report, Week 1 and Week 5, p = .83



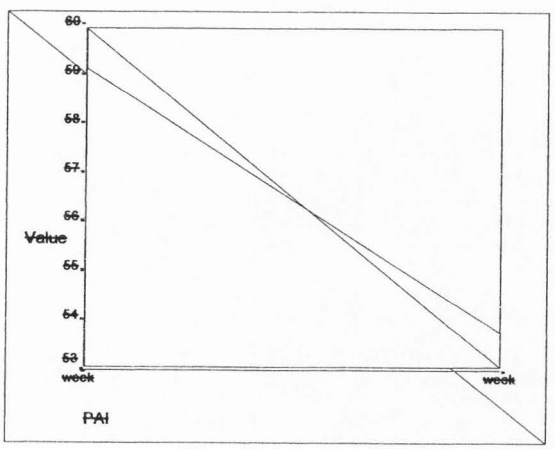
Graph 10

Control Group, Youth Self-Report, Week 1 and Week 9, p = .01



Graph 11

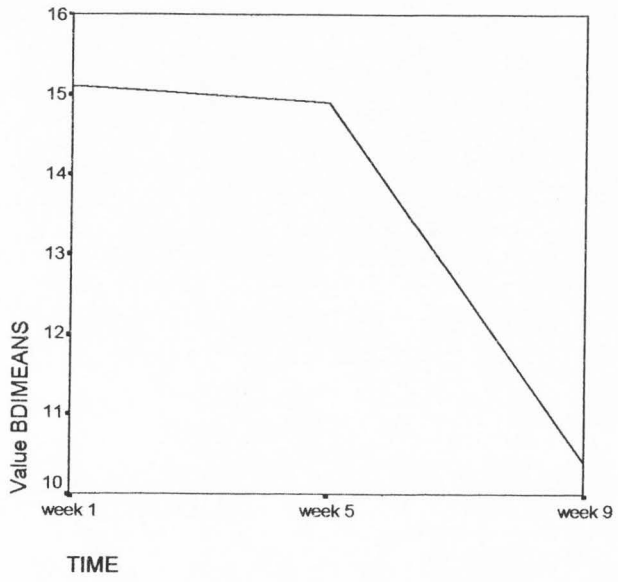
Control Group, Youth Self-Report, Week 5 and Week 9, p = .001



Overall control group mean scores across the three data points for the Beck Depression Inventory and the Youth Self-Report can be seen in Graphs 12 and 13, respectively.

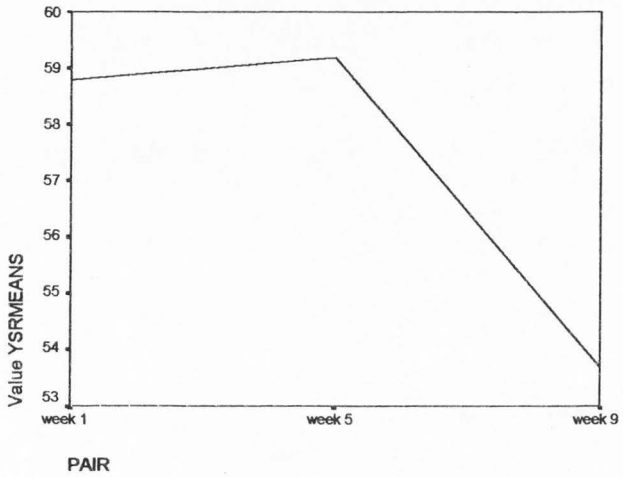
Graph 12

Control Group, Beck Depression Inventory Mean Scores



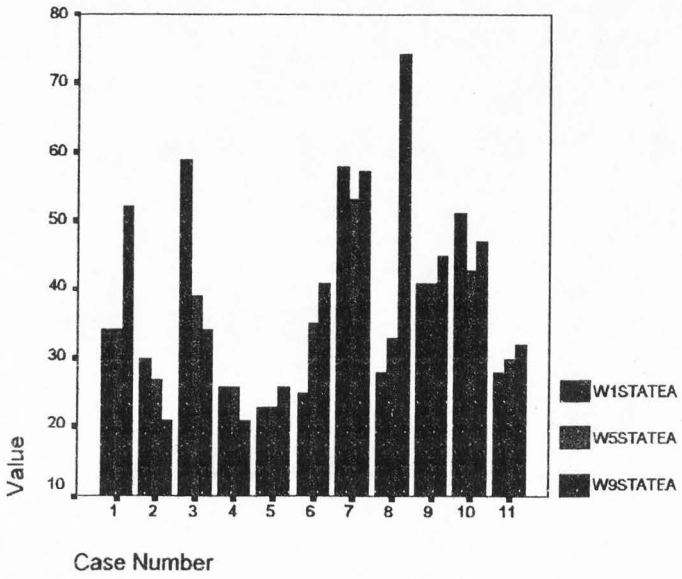
Graph 13

Control Group, Youth Self-Report Mean Scores



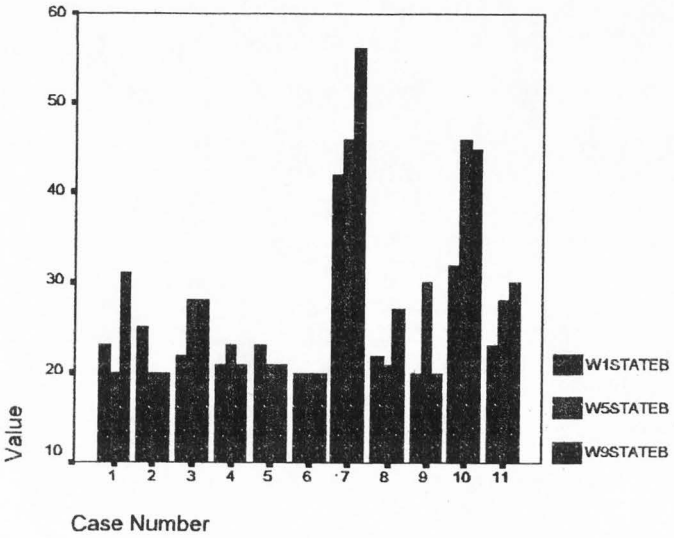
Graph 14

Treatment Group, Pre-AAT State Anxiety



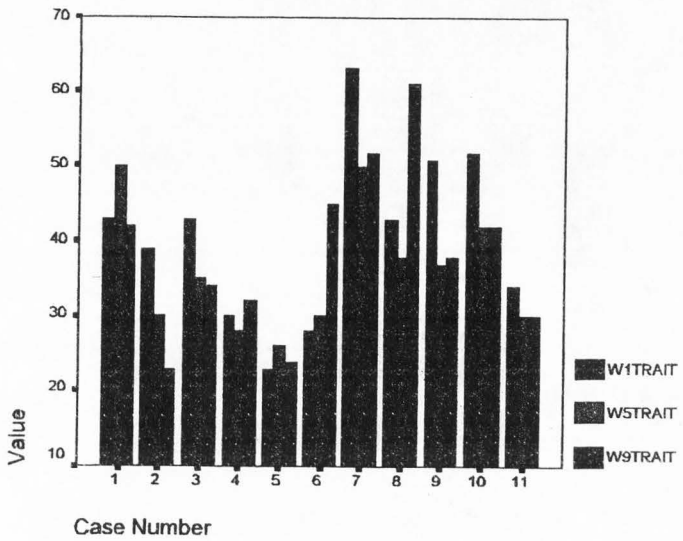
Graph 15

Treatment Group, Post-AAT State Anxiety



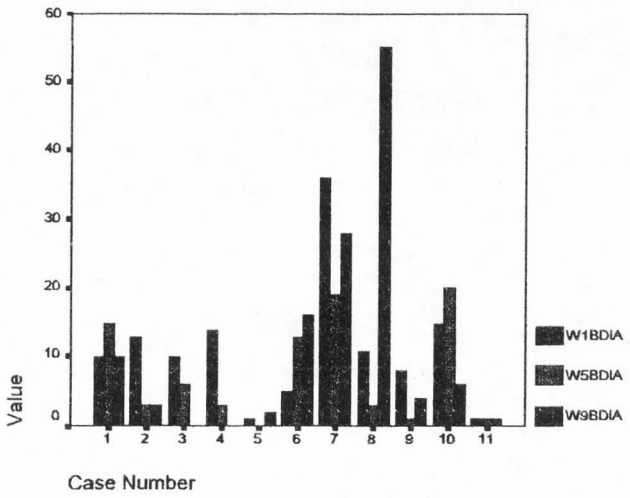
Graph 16

Treatment Group, Trait Anxiety



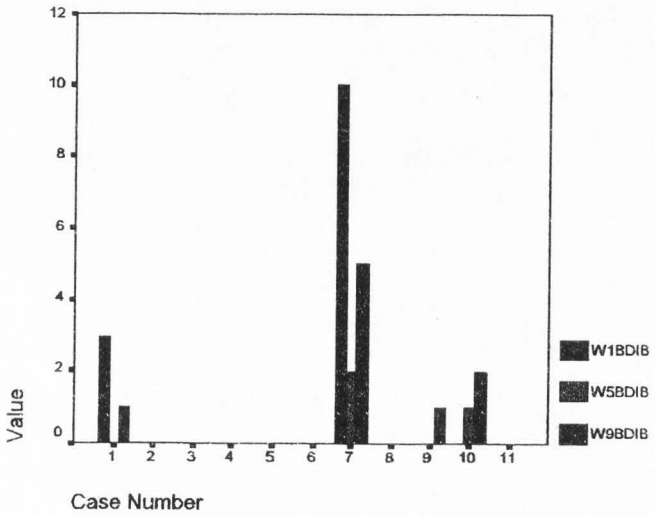
Graph 17

Treatment Group, Pre-AAT Beck Depression Inventory



Graph 18

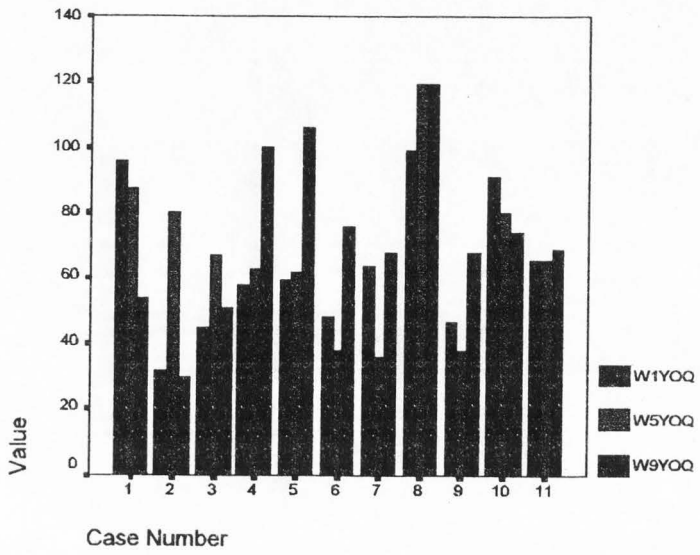
Treatment Group, Post-AAT Brief Beck Depression Inventory



Note. No bars indicate zero scores.

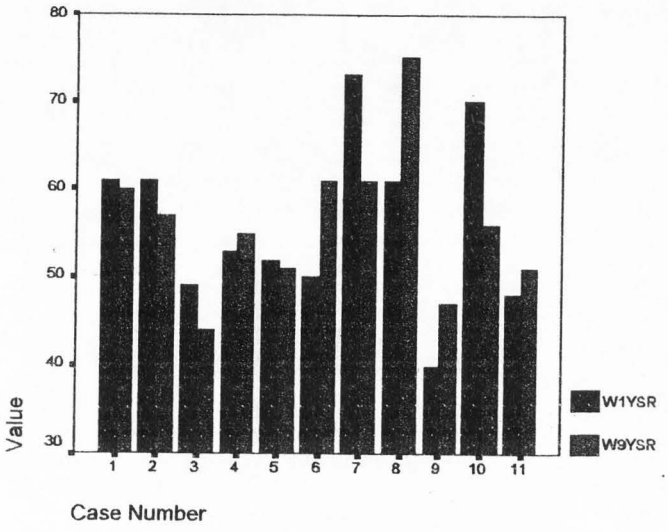
Graph 19

Treatment Group, Youth Outcome Questionnaire



Graph 20

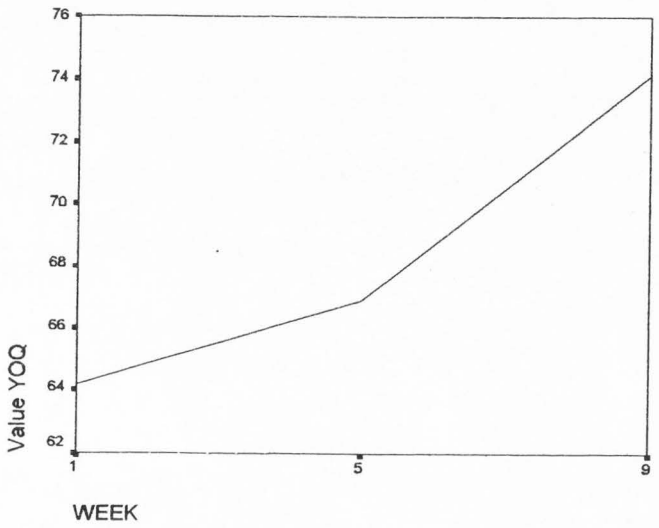
Treatment Group, Youth Self-Report



Graphs 21- 27 graphically show treatment subjects' mean scores for each assessment over the 9-week experimental period.

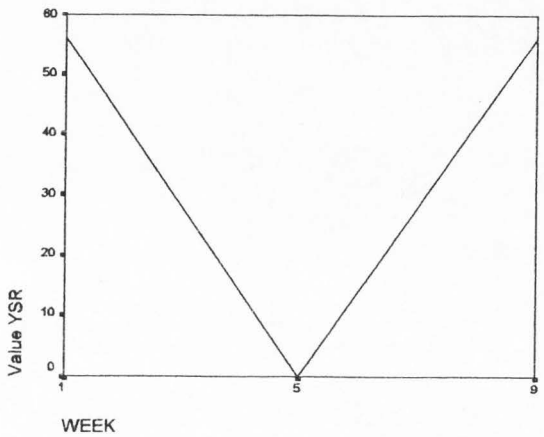
Graph 21

Mean Treatment Youth Outcome Questionnaire Scores



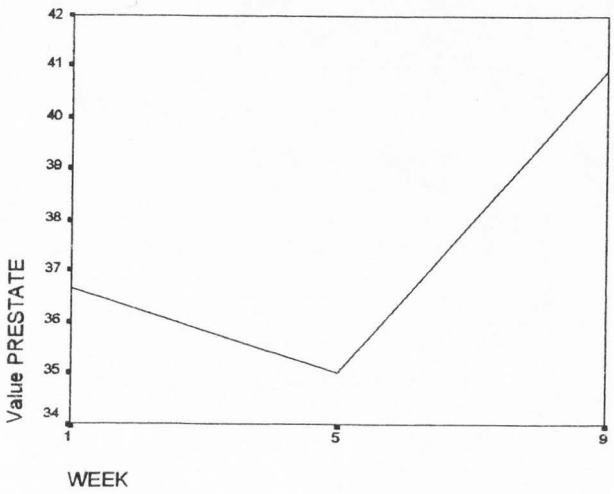
Graph 22

Mean Treatment Youth Self-Report Scores



Graph 23

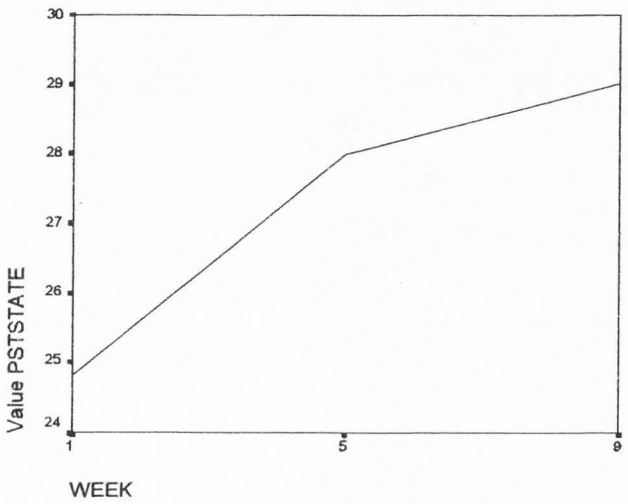
Mean Treatment Pre-AAT State Anxiety



Graph 24

Mean Treatment Post-AAT State Anxiety Scores

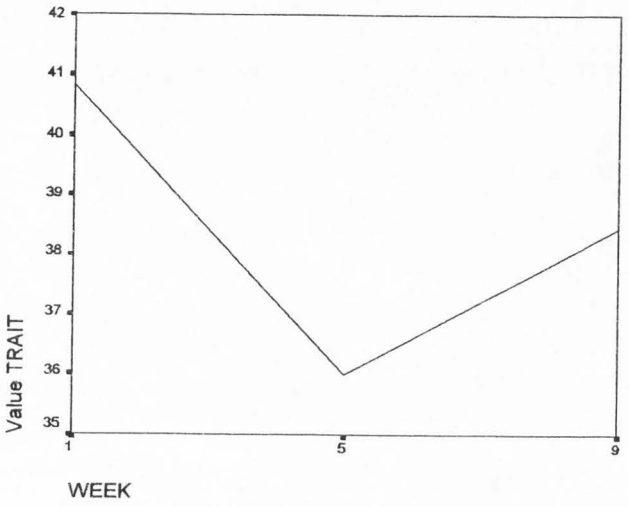
* Week 1 – Week 9 (t = -2.263, p = .047)



Graph 25

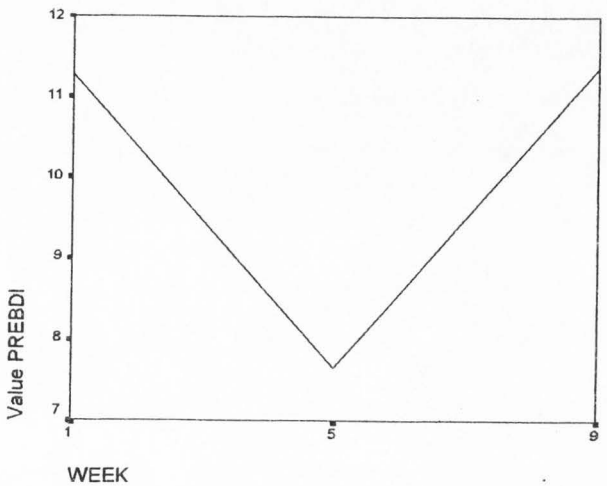
Mean Treatment Trait Anxiety Scores

* Week 1 – Week 5 (t = 2.352, p = .041)



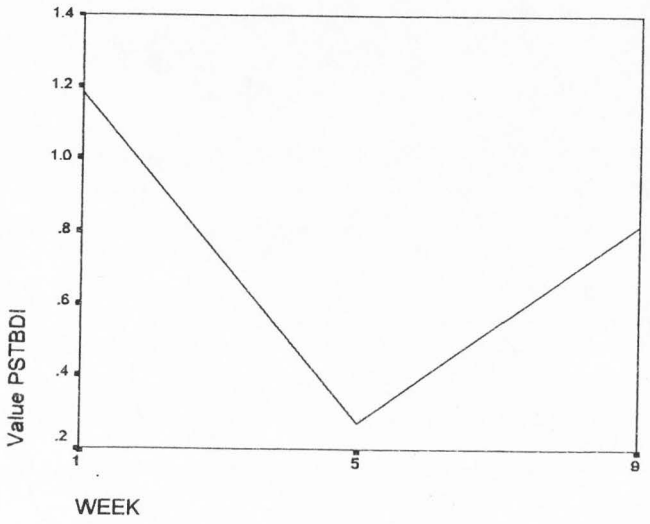
Graph 26

Mean Treatment Pre-AAT Beck Depression Inventory Scores



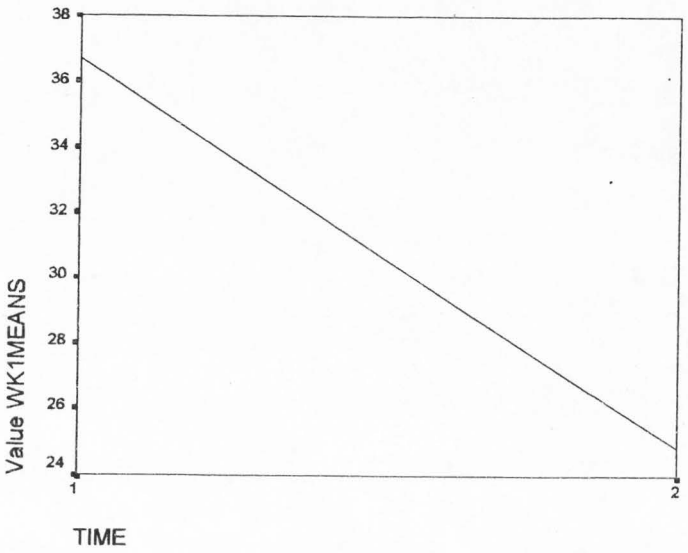
Graph 27

Mean Treatment Post-AAT Brief Beck Depression Inventory Scores



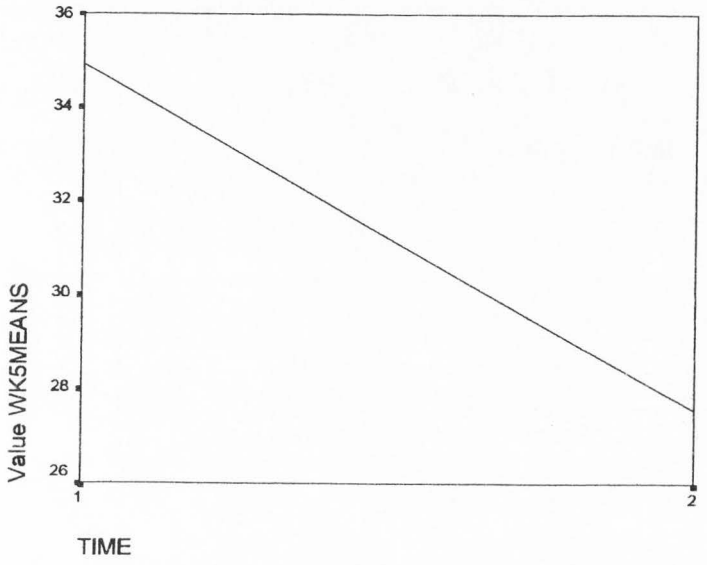
Graph 28

Treatment Group, Week 1 Pre- Versus Post-AAT State Anxiety Scores, p = .004



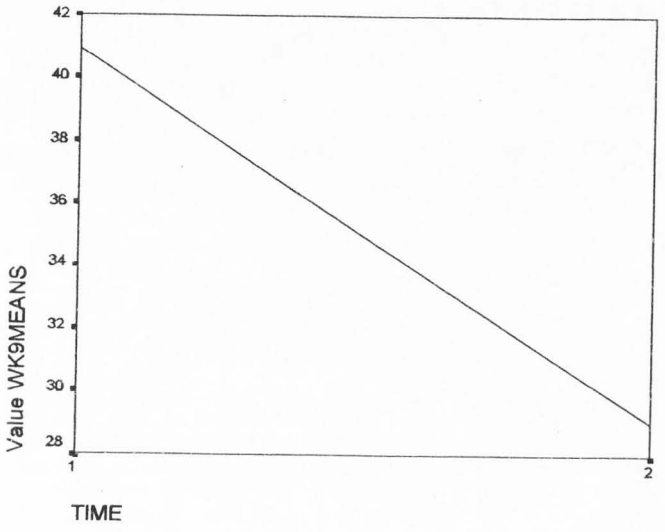
Graph 29

Treatment Group, Week 5, Pre- Versus Post-AAT State Anxiety Scores, p = .002



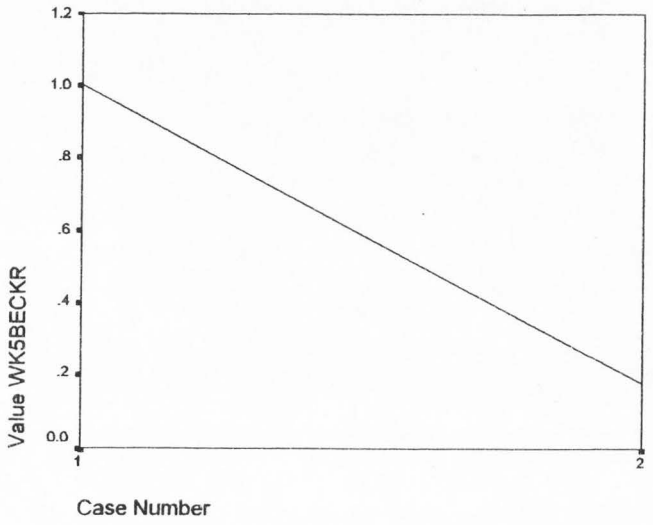
Graph 30

Treatment Group, Week 9, Pre- Versus Post-AAT State Anxiety Scores, p = .024



Graph 31

Treatment Group, Week 5, Pre- Versus Post-AAT Brief Beck Depression Inventory, p = .02



Appendix D:

Consent/Assent Forms

Assessments

Informed Consent

Changes in Child Symptomatology Associated with Animal-Assisted Therapy

Introduction/Purpose: Catherine Woolley and Professor Ascione in the Psychology Department at Utah State University are conducting a research study to find out more about the relationship between Animal-Assisted Therapy (AAT) and mental health symptoms in adolescents. You have been asked to participate because your child is receiving mental health services through *True To Life Children's Services* (TLC) and will possibly have the opportunity to participate in an Animal-Assisted Therapy program upon completion of this research project. There will be approximately 10 participants at this site.

Procedures. If you agree to allow your child to participate in this research study, he/she will be asked to report any feelings of depression and anxiety as well as a variety of behaviors while receiving services at TLC. Your child would be expected to complete three brief questionnaires on three occasions over a 9-week time period.

New Findings. During the course of this study, you will be informed of any significant new changes (either good or bad), such as changes in the risks or benefits resulting from participation in the research, or new alternatives to participation that might cause you to change your mind about continuing to allow your child to participate in the study. If new information is provided to you, your consent to continue participating in this study will be re-obtained.

Risks. If your child discusses previously unknown abuse, or indications of self-harm or harm to others, this information will be released to the proper authorities.

Unforeseeable Risks. There are no unknown risks that are currently foreseeable.

Care if harm. If your child is injured as a direct result of participation in this research, Utah State University and TLC are not responsible for any medical care your child may require. The University will not provide any other form of compensation to you or your child if your child is injured. You may call the IRB at (435) 797-1180 for more information about your rights as a research subject or research-related injuries.

Benefits. There may or may not be any direct benefit to you or your child from these activities. The investigator, however, may learn more about the use of Animal-Assisted Therapy as an additional treatment for emotionally troubled children and adolescents. It is likely that information gained from this research may benefit professionals in the future.

Explanation and offer to answer questions. _____ has explained this study to you and answered your questions. If you have other questions or research-related problems, you may reach Catherine Woolley at (435) 797-1460.

Voluntary nature of participation and right to withdraw without consequence. Participation in this research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence or loss of benefits.

Confidentiality. Research records will be kept confidential (private) consistent with federal and state regulations. Only the investigator and TLC will have access to the data, and it will be kept in a locked file cabinet in a locked room. The data will be kept for three months and then destroyed.

IRB Approval statement. The Institutional Review Board (IRB) for the protection of subjects at Utah State University has reviewed and approved this research project.

Copy of consent. You have been given two copies of this Informed Consent. Please sign both copies and retain one copy for your files.

Investigator Statement. "I certify that the research study has been explained to the above individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered."

Signature of PI and student.

_____	_____
Frank Ascione, Ph.D.	Catherine Woolley, M.A.
Principal Investigator	Student Researcher
(435) 797-1464	(435) 797-1460

Sign if you agree to participate.

Signature of Subject.

_____	_____
Parent/Guardian	Date

Child/Youth Assent. I understand that my parent or guardian is aware of this research study and that permission has been given for me to participate. I understand that I will be asked to answer questions about how I am feeling and some questions about things I have done (for example, gotten in fights, stolen, used swear words). I understand that my answers are totally private and will not be reported to anyone unless I share information about hurting myself, hurting others, or new information about someone hurting me. I understand that the questionnaires I will be filling out will take about 15-20 minutes on three separate occasions. I understand that it is up to me to participate, even if my parent/guardian says yes. If I do not want to be in this study, I do not have to, and no one will be upset if I don't want to or if I change my mind later and want to stop. I can ask questions that I have about this study now or later. By signing below, I agree to be a part of the study.

_____ _____

Name Date

Informed Consent

Changes in Child Symptomatology Associated with Animal-Assisted Therapy

Introduction/Purpose: Catherine Woolley and Professor Ascione in the Psychology Department at Utah State University are conducting a research study to find out more about the relationship between Animal-Assisted Therapy (AAT) and mental health symptoms in children and adolescents. You have been asked to participate because your child is participating in an AAT program at the Forget Me Not Farm (the Farm). There will be approximately 10 participants at this site.

Procedures. If you agree to allow your child to participate in this research study, he/she will be asked to report any feelings of depression and anxiety as well as a variety of behaviors while participating in activities at the Farm. Observations will also be made by trained volunteers at the Farm while your child is interacting with the Farm's therapy animals. Your child would be expected to complete two brief questionnaires on a bi-weekly basis (every other week, before and after interacting with the therapy animals), with one additional questionnaire at the start and finish of a 9-week time period.

New Findings. During the course of this study, you will be informed of any significant new changes (either good or bad), such as changes in the risks or benefits resulting from participation in the research, or new alternatives to participation that might cause you to change your mind about continuing to allow your child to participate in the study. If new information is provided to you, your consent to continue participating in this study will be re-obtained.

Risks. Due to the possibility that your child will be interacting with animals, there is a slight risk of your child being harmed by an animal. However, the Farm has taken every precaution to substantially reduce the risk of harm to and by the animals, so that the chance of this outcome occurring is extremely unlikely. Also, if your child discusses previously unknown abuse, or indications of self-harm or harm to others, this information will be released to the proper authorities.

Unforeseeable Risks. Since this is an adjunctive (i.e., additional) treatment, there may be some unknown risks that are currently unforeseeable.

Care if harm. If your child is injured as a direct result of participation in this research, Utah State University and the Farm are not responsible for any medical care your child may require. The University will not provide any other form of compensation to you or your child if your child is injured. You may call the IRB at (435) 797-1180 for more information about your rights as a research subject or research-related injuries.

Precautions are also taken to ensure the safety of the therapy animals. Your child will be expected to follow the rules set up by the Farm to protect the animals.

Benefits. There may or may not be any direct benefit to you or your child from these activities. The investigator, however, may learn more about the use of Animal-Assisted Therapy as an additional treatment for emotionally troubled children and adolescents. It is likely that information gained from this research may benefit professionals in the future.

Explanation and offer to answer questions. _____ has explained this study to you and answered your questions. If you have other questions or research-related problems, you may reach Catherine Woolley at (435) 797-1460.

Voluntary nature of participation and right to withdraw without consequence. Participation in this research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence or loss of benefits. You may be withdrawn from this study without your consent by the investigator if your child engages in a harmful manner with the therapy animals.

Confidentiality. Research records will be kept confidential (private) consistent with federal and state regulations. Only the investigator and the Farm will have access to the data, and it will be kept in a locked file cabinet in a locked room. The data will be kept for three months and then destroyed.

IRB Approval statement. The Institutional Review Board (IRB) for the protection of subjects at Utah State University has reviewed and approved this research project.

Copy of consent. You have been given two copies of this Informed Consent. Please sign both copies and retain one copy for your files.

Investigator Statement. "I certify that the research study has been explained to the above individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised, have been answered."

Signature of PI and student.

_____	_____
Frank Ascione, Ph.D.	Catherine Woolley, M.A.
Principal Investigator	Student Researcher
(435) 797-1464	(435) 797-1460

Sign if you agree to participate.

Signature of Subject.

_____ _____

Parent/Guardian Date

Child/Youth Assent. I understand that my parent or guardian is aware of this research study and that permission has been given for me to participate. I understand that I will be asked to answer questions about how I am feeling and some questions about things I have done (for example, gotten in fights, stolen, used swear words). I understand that my answers are totally private and will not be reported to anyone unless I share information about hurting myself, hurting others, or new information about someone hurting me. I understand that the questionnaires I will be filling out will take about 10 minutes before and after each of 5 visits to the Forget Me Not Farm (the very first and very last weeks' questionnaires may take a bit longer). I understand that it is up to me to participate, even if my parent/guardian says yes. If I do not want to be in this study, I do not have to, and no one will be upset if I don't want to or if I change my mind later and want to stop. I can ask questions that I have about this study now or later. By signing below, I agree to be a part of the study.

_____ _____

Name Date

Changes in Child Symptomatology Associated with Animal-Assisted Therapy
Observer Notations

Date: _____

Child's Code Number: _____

Volunteer's Name: _____

During the Animal-Assisted Therapy portion of this child's visit to the Forget Me Not Farm, did this child disclose any information related to his/her abuse or traumatic experiences in any way? *A "disclosure" might include a specific comment about a particular traumatic incident, feelings associated with an abusive event, vague reference(s) to being hurt previously, or recollections of witnessing abusive or traumatic events.*

yes _____ no _____

If yes, please record to the best of your abilities, any disclosure-type comment(s) made by the child:

CURRICULUM VITAE

Catherine Carnes Woolley
425 Bryn Mawr
San Antonio, Texas 78209
(210) 824-1189

EDUCATION

Doctor of Philosophy, Combined Clinical/Counseling/School Psychology (APA-accredited, Professional-Scientific Program), in progress
Utah State University, Logan, UT

Master of Arts, Developmental Psychology, 1994
University of Houston, Houston, TX

Bachelor of Arts, Psychology and Spanish Literature, 1987
Vanderbilt University, Nashville, TN

PROFESSIONAL EXPERIENCE

Staff Clinician
University of Texas at San Antonio
Counseling Services 2004-present

- Carry a diverse caseload of 13 individual clients/week using both short- and long-term interventions
  - Conduct initial intakes
  - Provide on-call for crisis services 11 hours per week
  - Consult with faculty, staff, and students
  - Present outreach workshops on cultural diversity, stress management, and sexual assault

Predoctoral Intern
University of Notre Dame Counseling Center 2003-2004

- Carry a diverse caseload of 13 individual clients/week using both short- and long-term interventions
- Conduct initial intakes
- Provide on-call for crisis services 3 hours/week plus 4 weeks of emergency beeper coverage
- Consult with faculty, staff, and students
- Present outreach workshops on cultural diversity, stress management, and sexual assault

Co-facilitate personal growth therapy group
Participate on Outreach, Alcohol and Other Drugs, and Search committees
Supervise practicum student therapist
Partake in specialized training related to assessment and treatment of alcohol and substance use
Perform psychological evaluations of applicants for an international missionary project.
Supervised by Len Hickman, Ph.D. and Luis Manzo, Ph.D.

Graduate Assistant
Utah State University Counseling Center 2002-2003
Carried caseload of 12 individual clients/week
Conducted initial intakes
Provided on-call crisis services 2 hours/week
Consulted with faculty, students, and staff
Co-lead interpersonal therapy and Dialectical Behavior Therapy groups
Provided supervision and training to undergraduate peer counselors
Presented outreach programs for residential staff on eating disorders, mental health referrals, personality disorders, and affective disorders
Worked daily with Certified Therapy Dog
Supervised by Mary Doty, Ph.D. and Dave Bush, Ph.D.

Practicum Therapist
Utah State University Community Clinic 2002-2003
Carried caseload of 7 individual clients/week
Conducted initial intakes
Administered personality assessments and interpreted results
Worked daily with Certified Therapy Dog
Supervised by Susan Crowley, Ph.D.

Disaster Mental Health Worker
American Red Cross 2001-2002
Completed Red Cross Disaster Training I and II
Provided brief, crisis counseling at Olympic venues for the 2002 Winter Olympics in Salt Lake City, Utah, with multidisciplinary team of Disaster volunteers.
Supervised by Richard Heaps, Ph.D.

Practicum Therapist
Utah State University Counseling Center 2001-2002
Conducted initial intakes
Carried caseload of 6 individual clients/week
Provided crisis counseling to adults
Supervised by Mary Doty, Ph.D.

Practicum Therapist
Utah State University Center for Persons with Disabilities 2000-2001
Administered, interpreted and wrote clinical evaluations based on achievement, intelligence, personality and developmental tests with children and adolescents
Conducted sexual abuse interviews with Certified Therapy Dog
Provided training on child maltreatment to staff and students
Supervised by Patricia Truhn, Ph.D.

Practicum Therapist
Utah State University Community Clinic 1999-2000
Conducted initial intakes
Provided individual therapy for caseload of 5 children and adults
Administered assessments and created psychological reports
Supervised by Susan Crowley, Ph.D., and Gretchen Gimpel, Ph.D.

ACADEMIC POSITIONS

Instructor
Utah State University, Psychology Department 2000-2002
Taught Introduction to Psychology 1010
Developed course lectures, exams, research and writing assignments
Graded tests and papers
Provided study sessions and held office hours

Teaching Assistant
Utah State University, Psychology Department 1999-2002
Assisted Frank Ascione, Ph.D. and Camille O'Dell, M.A. with the following courses: Abuse and Neglect 3120, Child Development 1100, and Adolescent Development 2100
Taught classes, created and graded exams, graded writing assignments, and managed students' grades
Provided study sessions and held office hours

Instructor
Metropolitan State College of Denver, Psychology Department 1997-1999
Taught Introduction to Psychology 101 and Child Development 315
Developed course lectures, exams, research and writing assignments
Graded tests and papers
Provided study sessions and held office hours
Served on committee to review and select undergraduate textbooks

Instructor
University of Houston, Psychology Department 1989-1994
Taught Child Development 3360

Developed course lectures, exams, research and writing assignments
Graded tests and papers
Provided study sessions and held office hours

Research and Publications

Woolley, C. & Ascione, F. (2004, submitted). *Changes in Symptoms Associated with AAT.* Submitted to Anthrozoos, November, 2004.

Woolley, C. (April, 2004, expected defense date). *Changes in Child Symptomatology Associated with Animal-Assisted Therapy.* Doctoral dissertation, Utah State University, Logan, UT.

Woolley, C. (1994). *Day Care Quality: Defining Caregiver Training.* Unpublished master's thesis, University of Houston, Houston, TX.

Presentations

Woolley, C., Lafferty, M., Bowden, H., & Simmelink-Johnson, S. (2004, February). *Becoming a Specialist: Implementing Specialty Service and Training in Eating Disorders and Substance Abuse.* Presentation at the Big 10 Counseling Center Conference: Enhancing Professionalism--Staying Current, Gaining Depth, Having Fun Together, West Lafayette, IN.

Woolley, C. (2002, November). *Treating Child Trauma with the Help of Animal-Assisted Therapy.* Presentation at the Annual Counseling Center Director's Conference, Park City, UT.

Woolley, C. (2002, October). *Treating Child Trauma with the Help of Animal-Assisted Therapy.* Poster presented at the Kansas Conference in Clinical Child and Adolescent Psychology: Translating Research into Practice, Lawrence, KS.

Research Interests

Alternate/adjunctive interventions for treatment of trauma
Violence prevention/Harm reduction models
Animal-Assisted Therapy
Counseling for developmental concerns
Humanistic/Person-Centered counseling
Multicultural counseling

HONORS AND AWARDS

1999-present, Utah State University Dean's List
1999-present, American Indian Support Project Scholarship
Student Representative to Utah Psychological Association
Student Representative to American Psychological Association Graduate Student committee, Utah division

ASSOCIATION MEMBERSHIPS

2002-present, Society of Indian Psychologists
1999-present, American Psychological Association