EFFECTS OF INTEGRATING ANIMAL-ASSISTED THERAPY WITH K-12 YOUTH PLACED AT-RISK

by

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Abstract

Interventions exist to provide treatment for youth at-risk. However, limited use of animal-assisted therapy (A-AT) is currently employed as a reputable intervention strategy in schools and other public service institutions. The purpose of this literature review is to examine animal-assisted therapy with youth labeled at-risk for poor academic and general life outcomes. Specifically, the paper addresses the social, emotional, and cognitive effects resulting from intervention involving a variety of A-AT programs. Recommendations for teachers interested in A-AT and possible future research are also suggested in the concluding paragraphs.
Chapter One: Introduction

The numbers of students placed in an at-risk category for academic or social failure in the public school system continue to rise. While there are a multitude of factors contributing to categorization of students ‘at-risk’, students with special needs can be labeled at-risk because they often exhibit low academic performance. All consequences of being at-risk point to a greater likelihood of negative life outcomes (Burgon, 2011). Students eligible for special education services alone increased 16% over the past seven years (Lerner & Johns, 2012). Alternative therapies, like A-AT, are beginning to be used with students in promotion of positive academic and behavioral growth.

Animals as co-therapists are increasingly becoming incorporated into American school settings to help teach students important behavioral and academic lessons. Many researchers observed children who are not comfortable interacting with other humans often do not feel the same inhibition with animals (Siegel, 2004). Since the number of special education cases continue to grow, and therefore the number of youths placed at-risk also increases, more options for beneficial therapeutic interventions will be necessary. Even if detected early, traditional interventions commonly exhibit slow remediation and often involve the use of prescription medication, which often have unwanted side effects. Other interventions should be considered to optimize success of students placed at-risk.

A recent amendment to the Americans with Disabilities Act defined a service animal as any dog that is individually trained to do work or perform tasks for the benefit of an individual with a disability, including a physical, sensory, psychiatric, intellectual, or other mental disability (Shubert, 2012). The use of service dogs can now be included in individual education plans for students with disabilities. Service dogs differ from therapy animals in that service dogs are
trained for use with one specific individual and are legally permitted to enter almost any setting, whereas therapy dogs need permission. Constraints do exist, but evidence for contact with animals promoting healthy child development in a wide variety of ways is emerging. Whether using service dogs or a variety of service animals, many professionals feel animal-assisted therapy (A-AT) is not given the respect as an effective therapeutic intervention (Edenburg & van Lith, 2011; Geist, 2011).

Many contributing authors discussed the need for greater research (Holmes, C. M. P., Goodwin, D., Redhead, E. S. & Goyamour, K. L., 2012; Geist, 2011, Friesen, 2009; Bennett, E.A., Gee, N.R., Harris, S.L. & Sherlock, T.R., 2009). Animal-assisted programs with children are becoming increasingly popular and posit a strong constructivist approach tied to interactions with therapy animals, enabling youth to construct meaning from their environment. Several barriers can get in the way of A-AT acceptance and special considerations are necessary to ensure children and animals involved in programs are safe. Allergies are a concern where pre- and post-therapy hand washing, holding sessions outdoors, or using a separate room for sessions should be considered. Educating children on how to use a gentle approach toward animals should occur prior to any interactions (Friesen, 2009). In some cultures dogs are considered unclean and interaction between children and some animals is strongly dissuaded (Friesen, 2009).

It is critical to closely monitor any signs of stress placed upon participating therapy animals. Handlers should supervise therapy animals at all times and provide water, exercise, and breaks regularly. Finally, cost can become an issue with necessary training and veterinary care. Momentum continues to build through inclusion of A-AT in classrooms and other therapeutic environments with animals as non-judgmental participants, which may offer children unique and valuable forms of support (Friesen, 2009).
Background

In 2007, the number of students identified with learning disabilities in the public schools was 2,563,665 (Lerner & Johns, 2012). People with learning disabilities suffer from a neurological condition which affects a person’s ability to read, write, spell, speak, compute mathematics and the disability can interfere with social skills, memory, coordination, and attention. About 46% of all students with disabilities fall into the category of learning disabled (Lerner & Johns, 2012). Students with learning disabilities also fall into the category of ‘at-risk’ because they often suffer from low self-image, self-control, lack of trust for others, and other deleterious effects. However, these parameters are particularly problematic among this population of students with learning disabilities (Backi, Terkel, & Teichman, 2012). Students who exhibit the aforementioned traits will display more struggles academically, behaviorally, and psychologically. Many students fall into the category of “at-risk” by coming from environments where poverty, neglect, and abuse may be occurring. Additionally, many students with special needs have behavior problems, which also place those youth in an at-risk category. More than half of students with learning disabilities will spend their day in general education classes or, at times, in a resource room. Many strategies, supports, and therapies have been aimed at developing the social and academic performance of youth who are at-risk with special needs. New methods, including animal-assisted therapy, are beginning to take on a larger role in assisting youth in both special and general education settings. Although animal-assisted therapy is becoming popular, literature regarding A-AT shows a lack of unified theoretical framework (Geist, 2011).

Animals have been used in mental health interventions for hundreds of years, yet research did not commence until the 1960’s (Holmes, Goodwin, Redhead, & Goymour, 2012).
Boris Levinson (1978) was the first to contend a connection to animals, especially during childhood, could positively affect the human personality (Bachi, Terkel, & Teichman, 2011). Levinson claimed the therapeutic effect animals had with humans was through use as transitional objects (Geist, 2011). Many schools are beginning to tap into animal-assisted interventions as a means of improving student growth on a variety of levels. Although dogs and horses are two types of animals primarily used for A-AT, dolphins, farm animals and rabbits have also been incorporated into A-AT studies with mixed results. The purpose of this review is to explore educational research for the worthiness of incorporating any type of animal-assisted intervention into the curriculum of students who are or could be categorized as at-risk.

**Statement of the Problem**

Many youths have deficits in social and academic areas. These issues can be addressed through a variety of means, but establishing a connection with an animal involved in A-AT, a non-traditional type of intervention, could lead to meaningful improvements with youth who are given a chance for involvement. Lack of a unified theoretical framework creates a problem for professionals who realize the importance of A-AT for legitimizing and increasing funding options (Geist, 2011). If more animal-assisted interventions were incorporated into the lives of youth, perhaps less poor outcomes stemming from possible effects of placement in an at-risk category would become evident. In addition, more data should be gathered and investigated to help guide increased empirical research and acceptance of A-AT as a worthy intervention for helping students at-risk socially, emotionally, and academically.

**Theoretical Framework**

Theoretical framework of cognitive and social constructivism has helped in the development of this research. Constructivist perspectives use historic research of Piaget,
Vygotsky, Bruner, and Dewey (Woolfolk, 2010). Two central ideas revolve around constructivist theory. Central idea number one is where learners are active in constructing their own knowledge. The second central idea reflects social interactions in the knowledge construction process. Learners involved in therapeutic interventions would engage actively with animals to promote their individual construction and enhancement of knowledge. Working beside animals, learners have an opportunity to expand their social interactions in an alternative method to traditional therapy, which is typically person-to-person. “In social constructivism, learning means belonging to a group and participating in the social construction of knowledge” (Woolfolk, 2010, p. 312). Many animals are very social creatures which could help foster the chance to interact, build bonds, and help students construct knowledge by nonverbal communications and other actively involved interactions. Another idea behind constructivist theory is where meaningful learning takes place in real world tasks. By reading to an unbiased dog or interacting with horses, learners create meaning from real world tasks involving animals who add new dimensions to sensory experiences. Constructivist theories suggest a close association between animal-assisted interventions and academic and behavior responses in special and general education, which proposes key research questions. Answers may help provide reasons to continue researching, investigating, and implementing A-AT as a therapeutic support for youth.

Research Questions

1. To what extent do animal-assisted interventions reveal beneficial outcomes for increasing social and emotional achievement in students at-risk?

2. To what extent do animal-assisted interventions reveal beneficial outcomes for increasing cognitive achievement in students at-risk?
Definition of Terms

Terms related to the topic of animal-assisted interventions with school-aged youth follow. Definitions are provided to help clarify meanings of terms that will appear on a regular basis throughout the paper. Various sources were used for the definitions and can be found immediately following the key term.


Animal-Assisted Therapy (A-AT). Therapy planned for individual children as part of a curriculum (Jalongo et al., 2004).

At-Risk. This definition is put forth by the US Department of Health and Human Services, At Risk, Behavioral Health, and Human Services Coordination (ABC): Before, during, and after an incident, members of at-risk populations may have additional needs in one or more of the following functional areas: communication, medical care, maintaining independence, supervision, and transportation. Individuals who may need additional response assistance include those who have disabilities, live in institutionalized settings, are from diverse cultures, have limited English proficiency or are non-English speaking, are transportation disadvantaged, have chronic medical disorders, and have pharmacological dependency (U.S. Department of Health & Human Services, 2012).

Equine-Assisted Activities. Activities centered on the horse in which the purpose is to learn horse-related skills (e.g. riding) and improve a person’s quality of life (Macauley & Gutierrez, 2004).
**Hippotherapy.** Physical, occupational, or speech therapy treatment strategy utilizing equine movement (Macauley & Gutierrez, 2004).

**Service animal.** Service animals are dogs that are individually trained to do work or perform tasks for people with disabilities (U.S. Department of Health & Human Services, 2012).

**Summary**

Students in my special education classroom have a variety of emotional, behavioral, and intellectual disabilities. Many students are curious about and are naturally drawn to animals. At Teaching Family Homes, where I am currently employed as a classroom teacher, we have a unique, wooded campus setting where animals could be cared for and used in treatment sessions. If animal-assisted interventions could be utilized with students at Teaching Family Homes’ residential treatment program classroom, prosocial and academic gains could potentially be made in a variety of ways. The Teaching Family Homes’ campus setting and similar settings could be places where more data collection in the emerging field of using animals for interventions with at-risk youth, and all students in general, could take place. In fact, a growing number of institutions have been integrating animals into therapeutic programs (Kotrschal & Wedl, 2009). Empirical research, versus anecdotal research, could also be supported in a residential and campus setting. Researching animal assisted interventions may not only be justified for my personal educational situation, but through networking and exposure to the topic, more educators may become informed and consider using A-AT with their students. Teachers may also investigate or conduct more research, adding to the collective pool of A-AT information and use. This review of literature examined the utilization of animal-assisted therapy with students who were at-risk and the subsequent social, emotional, and
academic impact attributed to A-AT intervention. The review also includes
recommendations for future research and suggestions for teachers who may be interested
in utilizing A-AT in their classroom.

In order to narrow the scope of this research and access a manageable set of literature,
this review focuses on animal-assisted therapy with children at-risk. “Animal-assisted therapy”,
“animal-assisted intervention”, “animal-assisted therapy and children”, or ‘animal-assisted
therapy and youth at-risk” are key words or phrases used to search the OneSearch database made
possible through Northern Michigan University’s Olson Library application. Current sources of
literature were selected and stemmed mainly from peer reviewed journal articles.
Chapter Two: Literature Review

Animal-assisted therapy programs are a relatively recent, yet emerging intervention in the United States. A variety of positive outcomes from using A-AT with youth placed at-risk have been documented. While a vast amount of literature is based on qualitative measures, quantitative research is progressing. The majority of empirical studies examined throughout this review stem from data collected on individuals participating in semester-long A-AT interventions. Topics of review include social and emotional outcomes using A-AT with youth placed at-risk, as well as cognitive effects of using A-AT with youth placed at-risk.

Social/Emotional Effects of A-AT

Children with learning disabilities or conduct problems are at risk for the development of severe emotional disorders in adolescence (Ewing, MacDonald, Taylor, & Bowers, 2007). Positive and effective interventions are crucial in replacing behaviors, which could lead to more serious problems in adulthood. However, youth who show signs of problems may not benefit from traditional therapeutic interventions. Many at-risk adolescents view therapists, teachers, or adults in general with mistrust, so incorporating alternative methods of therapy may aid in overcoming this hurdle of apprehension (Ewing et al., 2007). Many strategies, supports, or therapies aim to improve social interactions and the everyday lives of children at-risk. Therapeutic sessions with dogs, horses, dolphins or other animals reveal benefits of improved pro-social behavior (Grandgeorge, Tordjman, Lazartigues, Lemonnier, Deleau, & Hausberger, 2012). Pro-social behaviors, like trust and empathy, are critical to a child’s development.

Trust. Adolescents increasing trust as a result of A-AT using equine-facilitated psychotherapy and learning was investigated in two separate studies. The first study used a mixed methods approach and conducted a three-year longitudinal study. Effects of an alternative
therapeutic learning method on youths with severe emotional disorders (SED) was studied (Ewing, MacDonald, Taylor, & Bowers, 2007). Twenty-eight youths ranging in age from ten to thirteen from an alternative day school participated in the equine-facilitated learning program, named Horse Power. Individual sessions lasted nine weeks. Youths involved all suffered from moderate to severe behavior disorders and/or learning disabilities. The authors used a Self-Perception Profile for Children self-reporting measurement instrument to evaluate the participant’s pre and post testing self-esteem scores. Other measurements included an Empathy Questionnaire, Locus of Control Scale, Children’s Depression Inventory, and Children’s Loneliness Questionnaire. Each measure used paired t-tests for analysis. The control group consisted of students who were awaiting participation in the nine-week Horse Power session. Quantitative measures revealed no significant differences between the pre-tests and post-tests involving the experimental group. Even though the quantitative results were statistically insignificant, qualitative information from case studies illustrated positive effects on youths following the program. Observational data collected from the special education teacher and the therapeutic riding instructor showed how one case study child transferred greater trust to his teacher after the program, as well as another student opening up and participating in discussions surrounding her fears and anxieties. These anecdotal observations suggest a call for more research (Ewing et al., 2007).

Trust was found to increase using A-AT involving a similar equine-facilitated psychotherapy (EFP) study. Research was conducted at a residential treatment facility for adolescents at-risk where fourteen residents comprised the treatment group and comparisons were made against fifteen residents who encompassed the control group and did not receive treatment. Due to ethical considerations, participants were not randomly selected. A case
manager for each adolescent made recommendations for treatment. Once weekly EFP sessions of fifty minutes each, for seven months was the treatment for research group participants (Bachi, Terkel, & Teichman, 2011). A Children’s Interpersonal Trust Scale was used to examine the parameter of trust with a reliability factor of $\alpha = .88$. The multi-directional variance test of the trust variant showed an increase of means between the before and after measurements ($M = 2.714$ before, $M = 3.071$). A decrease in means was found in the control group ($M = 3.4$ before, $M = 3.0$ after), and the interaction between the measure and the group ($F = .005, p > .05$) was not statistically significant. A trend of increase in trust was found in the research group compared to a decrease in trust found in the control group. Children who lack trust struggle building relationships and becoming attached to others. A qualitative research study by Geist (2011) proposed a conceptual framework called attachment theory to describe why animal-assisted therapy (AAT) may be effective in improving the socio-emotional and behavioral functioning of students with emotional disturbances. Insecure attachment results if the right hemisphere of the brain fails to mature. If this happens, a child experiences an unorganized state of mind and is unable to regulate arousal states such as fight or flight experiences. Caregivers of infants can influence attachment issues by inducing extreme levels of ongoing arousal, or neglect. Strong negative emotions are linked to memories of rejection and convey an unhealthy sense of self, which is explained using cognitive theory and harmonious with attachment theory. The author believes a student’s emotional state after AAT will break the sequence of negative automatic thoughts and help develop a healthier attachment and self-concept. Laughter can promote strong social bonding. The simple act of a dog bringing in a squeaky toy to a child in distress often prompts a smile and motivates continued attempts to play and stimulate more laughter. This type of interaction mimics the right-brain-to-right-brain interaction that promotes social bonding and
attachment. Some professionals feel AAT is not given respect as an effective intervention worthy of funding and implementation. Geist argues the lack of unified theoretical foundation continues to be a cause for why AAT as a profession continues to struggle to be seen as legitimate. Attachment theory is then used to describe why AAT may be effective in improving behaviors of students with emotional disturbances.

Trust is an important part of social relationships and without trust, barriers to social and academic growth can occur. Using animals as co-therapists is a relatively new treatment, but studies like the ones described previously show how one important social parameter, like trust, can potentially be improved through A-AT.

**Self-efficacy and self-esteem.** Emotional effects of A-AT have also been studied. With one in four youth experiencing emotional or behavioral problems, therapy of some type will be needed (Holmes et al., 2011). Self-efficacy and anxiety are two separate parameters, but linked on an emotional scale where researchers chose to analyze in the following two studies. A twelve-week intervention using farm animals examined the effect of self-efficacy among adult psychiatric patients with a variety of diagnoses. Ninety patients with thirty serving as controls participated in the randomized study. More than half of the patients had been ill for more than five years. One or two patients at a time visited a farm with a variety of animals and spent three hours, twice a week caring for cattle, rabbits, poultry, pigs, dogs, and cats. Self-efficacy was measured with the Generalized Self-Efficacy Scale (GSE) testing the strength of an individual’s belief in his ability to respond to difficult situations (Berget, Ekeberg, & Braastad, 2008). Analysis of variance (ANOVA), matched-paired t-tests, and a Spearman correlation analysis measured correlations between self-efficacy and coping. Patients with the largest increase in self-efficacy during the intervention also showed the largest increase in coping ($r = .45, p = .0029$)
and during a six-month follow-up period, self-efficacy was significantly better in the treatment group (Berget et al., 2008). Although participants were adults, the results help to answer my research question regarding the socio-emotional benefits of A-AT. Early interventions with youths at risk could alleviate potential problems leading into adolescence and adulthood.

Another study explored the benefits of equine assisted activities on twelve to thirteen-year-old adolescents with emotional, behavioral, and learning difficulties. The authors hypothesized trait anxiety would decrease and self-esteem would increase following interactions. Eleven participants and two retired thoroughbred racehorses were used in the study. Trait anxiety was measured using the Spence children’s anxiety scale (SCAS), while self-esteem measures were recorded using the Rosenberg self-esteem scale (SES). Participants interacted with a model horse at the initial session, then with real horses in preceding sessions, lasting three hours, for four sessions. Experimenters recorded the frequencies of behaviors every fifteen minutes during each session. Average anxiety scores decreased at each collection point and the ANOVA revealed this decline to be significant ($p = .05$). Self-esteem scores indicated little change over the course of the program. Although the hypothesis that self-esteem would significantly change during the study was not supported, a significant reduction in reported anxiety was noted. Further replications of similar studies with larger sample sizes would allow for greater observation of A-AT effects and trends on youth placed at-risk (Holmes et al., 2011; Bachi et al., 2011).

Another form of animal-assisted therapy involved children building social competence by interacting with rabbits. Researchers in Krems, Austria quantitatively analyzed results from a study involving fifty children between the ages of three and seven. The author’s goal was to investigate how differential interest in rabbits could be related to age, gender, family background, and personality components. Kortschal and Wedl (2009) hypothesized socially
competent children would be particularly interested in rabbits and would seek more contact with them. A total of nine days were video recorded and behavior coded by the first author. Check sheets were also used to record whether a child was playing in a group, alone, or with the rabbits. A Principal Component Analysis revealed four main components; confident/respected, patient/calm, cheerful/sociable, and solitary, all representing terms with $p < 0.1$. Overall, findings support the ‘social competence’ hypothesis where children high on the confident/respected scale and low on the solitary factor were particularly engaged in interactions with the rabbits. Children low in social status tended to linger in proximity to the rabbits, rather than interact actively with them (Kortschal & Wedl, 2009). Perhaps the socialization effect of having animals as conversation promoters allow less social children the means necessary to establish relationships with more confident and socially secure peers.

Some research points to confidence-building through the use of AAT. Research into the benefits of animal-assisted therapy (AAT) exists, but less is known about equine-assisted learning and therapy (EAL/EAT) where horses are used in therapeutic and learning interventions. A qualitative study by Burgon (2011) explored experiences of seven at-risk young people who participated in a therapeutic horsemanship (TH) program. The study captured experiences of youth within a participative ethnography. Youth TH sessions varied between one and three hours long weekly or intermittent sessions were attended. Session activities varied from spending time with horses, to discussing horse behavior, or looking after and working with horses. The ages of participants ranged from eleven to sixteen with five girls and two boys attending for several months up to two years. Data was collected in the form of detailed field notes and interviews. Many participants appeared withdrawn and unconfident when they first attended TH sessions. Being with horses seemed to provide different things to the youth and a
main theme which emerged from the study related to confidence-building and self-esteem. Results from this study suggest that relationships and experiences participants had with the horses helped them gain psychosocial benefits. Despite the limitations of a small case study, positive experiences by youth were clearly documented. Further research is needed to make generalizations, however youth may benefit by positive opportunities new social relationships and normalizing experiences can lead to, which can be especially limited to young people at-risk.

**Stress and anxiety.** Several studies looked at animal-assisted therapy as a means of stress reduction. One quantitative study conducted by Barker, Knisely, McCain, Pandurangi and Schubert (2010) researched the physiological stress response to human-animal interactions. The purpose of the study was to build on similar existing research, and investigate response patterns in a non-clinical sample of adult dog owners interacting with their own or interacting with an unfamiliar dog. Half of the group of ten, primarily female participants, who were over eighteen years of age, had a mean age of 51.5 years and met inclusion/exclusion criteria were therapy dog owners (TDO) interacting with their own dog. The other half of the participants were dog owners interacting with an unfamiliar therapy dog, as this is what usually occurs with animal-assisted activities (AAA). A pre-post within-subject design was used by researchers. This included a thirty minute baseline period where participants relaxed in a chair, and then a widely used method to experimentally induce stress using the Stroop Color Word Test was administered. Next, the five therapy dog owners interacted for thirty minutes with their own dog, followed by a sixty minute period where a video was watched. The same protocol was followed with the five other adults, except their interaction was with an unfamiliar dog. Noninvasive physiological measures, such as blood pressure, heart rate, salivary cortisol and salivary alpha amylase was measured, as well as “pet attitude” using the Pet Attitude Scale, trait anxiety using the Trait Form
of the State-Trait Anxiety Inventory and other subjective measures. Statistical differences were examined using t-tests, paired t-tests, and trends in mean outcome for all of the physiological measures were examined at baseline, post-stressor, during the intervention, and one, thirty, forty-five, and sixty minutes post-intervention. Results revealed consistent patterns of stress increasing with the stressor and decreasing following intervention. Positive attitudes toward pets were associated with decreased levels of self-reported stress $p < 0.05$ and salivary cortisol. In addition, higher levels of trait anxiety were associated with lower levels of heart rate and blood pressure $p < 0.05$. Conclusions are limited without the use of a control group. The strength of the study lies in the implications for future findings with human-animal interactions involving AAA.

Nelson and Harwood (2011) conducted a meta-analysis on anxious symptomatology among school-aged students with learning disabilities (LD) compared to their non-LD peers. Their quantitative study was completed to find out whether students with LD had higher mean scores as a measurement of anxiety, compared to non-LD peers. The authors used ERIC, PsycINFO, and ProQuest databases to find relevant studies. Fifty-eight studies were included in the means and standard deviations analysis of the groups. A random-effects statistical model used the true effect size varying from study to study. The combined studies examined 3,336 students with LD and ninety-seven effect sizes were analyzed. Analysis determined the overall effect size was statistically significant ($z=10.95$, $p<.001$) and medium in magnitude ($d=.61$). The majority of the studies, 55 of 58, revealed students with LD having higher anxiety than non-LD peers. The authors conclude that there is sufficient research evidence to correlate students with LD exhibiting more problems with anxiety than non-LD students. Additionally, the authors discuss the need for anxiety screenings and treatments to assist LD students who may have anxiety issues.
Pain. As of 2009, no formal studies were reported on the relationship between animal-assisted therapy (AAT) and pain in children. Braun, Stangler, Narveson and Pettingell (2009) conducted a quasi-experimental intervention study to capture the difference in pain level and vital sign indicators with or without AAT intervention. The sample included ninety-four immunocompetent children who had a normal bodily capacity to develop an immune response following exposure to an antigen. Children with ages ranging three to seventeen were targeted for the study if they reported a pain level of two or above using a pain scale in an acute care pediatric setting. Forty-seven children with an average age of 12.1 years were in each treatment versus control group. The intervention group underwent fifteen to twenty minute sessions over a span of three years. Baseline blood pressure, pulse rate, respiratory rate, and pain level data was collected. Unfortunately the desired sample size of ninety-four was not met due to the death of the AAT dog prior to the conclusion of the study. Therefore, results stem from the eighteen participants enrolled in the intervention group and thirty-nine in the control group. Cross-tabulation tables with chi-square statistics and two independent samples t-tests were used and indicated the intervention and control groups were very similar at baseline. The AAT intervention group experienced a significant reduction in pain level compared to the control group t (55) = -2.86, p = .006. Blood pressure and pulse were not impacted, but respiratory rates became significantly higher in the AAT group, compared to the control group by an average of 2.22 breaths per minute.

The authors conclude AAT appears to be a therapeutic intervention in which benefits greatly outweigh the risks. Moreover, this study provides evidence that AAT can effectively be used as a complementary therapy to reduce pain in children with stress reducing benefits as well.
Cognitive Effects of A-AT

**Language and learning.** Quantitative research findings are scarce demonstrating cognitive benefits following AAT intervention. The following studies used equine programs as a basis for such benefit findings. Examination of effectiveness utilizing hippotherapy for children with language-learning disabilities (LLD) was investigated. Hippotherapy utilizes equine movements as a treatment strategy for improving physical, occupational, social, and speech therapy (Macauley & Gutierrez, 2004). Three boys ranging from age nine to twelve were selected to undergo alternative hippotherapy treatment. Since the boys were already receiving traditional speech and language therapy, comparisons could be made between the two therapy types. After a full semester of traditional therapy, participants took part in hippotherapy sessions lasting one hour, twice a week, for six weeks. At the completion of both types of therapy, a twenty-one item client satisfaction questionnaire was given to participants and participant parents. A comparison of answers from questionnaires using paired *t* tests found the parents’ responses indicating *p* < .000, *t* = -12.73, df = 21 and participants responses indicating *p* < .002, *t* = -3.46, df = 21 (Macauley & Gutierrez, 2004). Results provide data indicating hippotherapy improves student motivation to attend therapy sessions, motivation to complete therapy, and speech and language abilities improved. Although the results show success with hippotherapy, the authors note the small number of participants and the idea of hippotherapy as a novelty for topics to consider when analyzing the study. Research into the effectiveness of hippotherapy as a treatment tool for clients with disorders other than LLD is needed (Macleay & Gutierrez, 2004; Thompson, Iacobucci, & Varney, 2012).

A variety of cognitive benefits was detailed on websites surrounding A-AT utilizing horses. Four Internet search engines were used in the following study to find 115 websites
related to hippotherapy and other equine programs. The authors used content analysis methodology to review websites for information related to program characteristics and benefit claims (Thompson et al., 2012). Data collected regarding cognitive benefits were categorized into six areas: sensory integration, attention, memory, academic and language/communication, and “other”, which included everything else, such as decision making and creativity. Of the 115 websites, the highest percentage at 49.6 fell into the language and communication category of website benefit claims. The next highest cognitive benefit claim was found in the sensory integration category at 35.7%. Improved memory was the least claimed benefit at seven percent, while academics, attention, and other cognitive benefits fell between 22 and 24%. Testimonial evidence was used in 44 of the 115 web sites. One example includes a six-year-old child with autism whose first words were, “Walk on,” bringing his mom and instructor to tears (Thompson et al., 2012). Most websites were not based on research evidence, but the intent was to view equine programs and their potential vast benefits. Also, if children with and without disabilities were limited only to activities where unequivocal therapeutic benefits have been experimentally demonstrated, then youth would surely be doomed to experiencing a limited range of activities (Thompson et al., 2012). Although cognitive benefits were based on claims instead of evidence, the use of a larger sample size provides an important component of quality research worthy of continued investigation.

**Following instructions.** Adhering to instructions is an important part of being a student or member of society. The following study used eleven, three-to five-year-old children for a motor skills task analysis. Six were identified with having language deficits, learning deficits, or underdeveloped social skills, while five were typical. Children competed against a real dog, a stuffed dog, or a human confederate. A variety of running, jumping and crawling tasks were
given. All tasks were videotaped and a Three-Way Mixed-Model Factorial ANOVA was conducted on the data. At $p < .01$, the main effect of Co-Performer was significant and pair-wise comparisons showed children adhered to instructions the best in the presence of a real dog ($M = 6.38$, $SD = 0.30$) and the human confederate ($M = 6.38$, $SD = 0.34$, $p < 0.05$). Results were not surprising as children have many opportunities to follow instructions in the company of other humans; however, authors discussed interesting findings of how children were equally likely to adhere to instructions in the presence of a real dog compared to a human (Bennett, Gee, Harris, & Sherlock, 2009). The mere presence of a dog may help children focus their attention on following instructions and engaging in tasks that help support cognitive development. Evidence for contact with animals promoting healthy child development across social, emotional, and cognitive realms is promising.

Children have a natural tendency to open up to animals. A qualitative study by Jalongo, Astorino and Bomboy (2004) reviewed research surrounding therapy dogs as assistants in school programs and health care treatment plans for children aged five to eight. The purpose was to address objections to allowing dogs in classrooms and patient rooms, as well as offer guidelines for maximizing positive outcomes of animal assisted activities and therapy (AAA/T). One review described the most well-known program, Reading Education Assistance Dogs (R.E.A.D.) which brings trained therapy dogs to school as a means to encourage reading with children. At least two grade levels were gained, some as much as four grade levels, for all students participating in the R.E.A.D. program which lasted 13 months. Another study reviewed the presence of a calm, attentive dog moderating stress in children. The study used blood analysis before and after positive interaction with the child’s pet dog and with an unfamiliar dog. Results indicated presence of a dog has a more calming effect than the presence of an adult and even
more than the presence of a supportive friend when children read aloud or have a routine medical exam. In one study of peer interaction, a child without disabilities was 10 times more likely to interact with a peer who had disabilities if the child had a dog with them. This human-animal bond lends support to results in which animals can be used as “social lubricant”, increasing psychosocial functioning in young children. The authors conclude various incidents in a hospital and classroom suggest trained therapy dogs and children in primary grades can support growth in learning, physical health, and emotional well-being.

Teachers often struggle with keeping their students on-task and following instructions. A quantitative multiple probe single case design addressed these effects following a dog reading visitation program in three elementary students with emotional and behavioral disabilities (EBD) (Bassette & Taber-Doughty, 2013). Student number one was a seven year-old second grader who read too quickly and did not decoder properly. Student one would become argumentative and refuse to complete assignments at times. Student two was an eleven year-old fifth grader who struggled with reading. His teacher reported student two read below grade level and struggled with anxiety. He frequently flipped through books without reading the text. Student three was an eleven year-old fifth grader who was challenged socially and academically. He read below grade level and often exhibited learned helplessness and frequently argued about beginning or completing assignments.

During intervention, students read to a therapy dog in a corner of the special education classroom. The dog reading program was the independent variable for the study, while the dependent variable was the percent of intervals of on-task reading aloud behavior. On-task reading was determined by direct observations from the researchers. All pet partner teams who helped with the study were certified by Pet Partners. All books were selected by students from
the teacher’s library and reading sessions lasted thirty minutes for each student every day of the week for four weeks. On-task behavior was observed every fifteen seconds during sessions and used a version of the Behavioral Observation of Students in Schools (BOSS). Results indicate student one was on-task during an average of 5% of the intervals during baseline and increased to an average of 96% of the intervals during intervention. Student 2 was on-task during an average of 70% of the intervals during baseline and an average of 92% during intervention. Student three was on-task during an average of 72% of the intervals and 97% of the intervals during intervention. In conclusion, results of this study indicate that on-task reading behaviors increased when students read to a therapy dog. Additionally, all students communicated they enjoyed reading to the dogs. Future studies would benefit by having a larger sample size and examining effects over a long-term reading program.

Professional educators now have mixed evidence to support and carry out A-AT as a potential positive force on children’s psychological, social, physical, and academic achievements. Interventions using A-AT are growing and offer hope to students and educators wishing to explore a myriad of cognitive, social, and emotional benefits. Literature reviewed in this paper reflects some benefits for students at-risk, but more research will be needed to support growth involving A-AT in school programs.
Chapter III: Results and Analysis Relative to the Problem

Results and Analysis

Many studies revealed a variety of social, emotional, and cognitive effects surrounding the use of A-AT which helped to answer my research questions: (a) To what extent do animal-assisted interventions reveal beneficial outcomes for increasing social and emotional achievement in students at-risk? (b) To what extent do animal-assisted interventions reveal beneficial outcomes for increasing cognitive achievement? Results from this review of literature indicate patterns of achievement across each category.

Social and Emotional Achievement

Relating to the social category, a trend of increase in trust was found in adolescents using equine-facilitated psychotherapy and learning (Ewing et al., 2007; Bachi et al., 2011). Although quantitative measures were statistically insignificant in one of the studies, observational data indicated greater trust from a participant of the study upon completion of the program.

Many more results related to the social and emotional effects of A-AT. Following A-AT as a means of treatment, several studies reported the importance of anxiety screenings for youth at-risk (Nelson & Harwood, 2011; Burgon, 2011). A reduction in anxiety was indicated from research involving the use of therapy dogs and equine assisted activities (Holmes et al., 2011; Barker, et al., 2010). Significant results tied to building self-efficacy were found in several studies (Berget, et al., 2008; Braun et al, 2009; Burgon, 2011; Kortschal & Wedl, 2009). Studies were limited with pain reduction after A-AT, but one study concluded with an A-AT intervention group experiencing a significant reduction in pain levels compared to the control group (Braun, et al., 2009).
Cognitive Achievements

Although research findings involving beneficial cognitive traits following A-AT are limited, improvements in language, learning, and communication was the outcome for some studies tied to equine assisted therapy (Macauley & Gutierrez, 2004; Thompson et al., 2012).

Some studies detailed cognitive effects of A-AT with youth at-risk. Following instructions supports cognitive development. Literature in this review details how children adhered best to following instructions and performing tasks when in the presence of a therapy dog (Bennett, et al., 2009; Jalongo, 2004; Bassette & Taber-Doughty, 2013). Researchers conclude this on-task behavior is critical in supporting growth in learning.

Drawbacks of Studies

Disadvantages exist into studies chosen for this review of literature. A common drawback for several studies was the small sample sizes involved in treatment groups (Bassette & Taber-Doughty, 2013; Macauley & Gutierrez, 2004; Burgon, 2011; Holmes et al., 2011). Researchers believe replications of similar studies with larger sample sizes would allow deeper understanding of A-AT effects.

Several studies lacked significant quantitative measures, but included anecdotal observations (Ewing, et al., 2007; Thompson, et al., 2012). These observations suggest more follow-up data can be collected from treatment participants after the conclusion on an A-AT intervention in order to shed more light into the extent of A-AT outcomes.
Chapter IV – Recommendations and Conclusion

Recommendations for Teachers

Teachers should be cognizant that traditional interventions with paper and pencil tasks may be difficult, repetitious, or monotonous for students and may not be the only options for intervention with youth at-risk. Although A-AT is slow to gain momentum, many positive outcomes have been documented. Some researchers suggest the lack of social skills may be the most critical hindrance to many individuals’ successful adult adjustment (Siegel, 2004). Importance rests upon educators reaching every student, as early as possible, and providing quality responses with a multitude of interventions. If A-AT is going to be included in the mix of evidence-based interventions promoting healthy child development used in schools, then qualitative coupled with quantitative and statistically significant results from studies must come forth. Furthermore, identification of which animals are best suited for targeting specific types of problems is necessary.

Educators should carefully plan and use only trained participants involved with A-AT. Having a signed permission slip on file from a child’s parent, allowing A-AT to take place would be an initial step. Other considerations for teachers to plan for are students’ fear of dogs, allergies, student excitability, or cultural differences. The participant who handles the animal during A-AT should be trained and certified with insurance coverage and must ensure the animal has up-to-date veterinary care. Teachers should only select animals they can properly care for. Administrators and staff should also be informed of where and when A-AT would be occurring. While much planning is necessary to implement A-AT, the potential benefits are vast, underrepresented, and worthy of incorporation into improving the lives of youth and society as a whole (Siegel, 2004).
Areas for Further Research

In order to find out more about the effects of animal-assisted interventions with youth at-risk, more research should be conducted. Youth at-risk for poor life outcomes will need interventions in order to overcome social, emotional, and academic deficits.

To find out which A-AT effects are strongest at different grade levels, a therapy dog program and study could be implemented in a participating K-12 district. Since reaching students early is important for correcting problems, students in grades three, five, and seven would be selected. Recommendations for students at-risk would come from special education teachers. Five students from each grade would spend 30 minutes each week for a nine-week semester intervention with a therapy dog and therapy dog owner. Twenty minutes of each session would be dedicated to reading and noting student behaviors. The initial or remaining ten minutes would be open for visiting and bonding with the therapy team.

Pretests and posttests using Fountas and Pinell running record reading assessments, along with behavior rating scales completed by youth involved in the study, parents of youth involved, and teachers of the youth involved would provide data used to compare results to a control groups’ results. The control group would include the same number of participants in the same grade and identified as at-risk by special education determination. However, the control group would receive intervention for their deficits which does not include animal-assisted therapy.

The data would be analyzed by looking for greater overall improvement between the youth who had intervention with A-AT, compared to youth who received traditional support for academic or behavioral needs. Researchers should continue to look for trends in the effects of A-AT for effectively increasing social, emotional, and cognitive achievements. This analysis would help show the various levels of support A-AT could provide youth identified at-risk.
Summary and Conclusion

Positive effects of using A-AT are revealed from this collection of studies and literature reviewed. Contact with animals may positively affect human health and compensate for individual deficits in social connectivity (Kotraschal & Wedl, 2009). Social constructivist theory relates to trust, which can be built with animals serving as transitional objects, or bridges with which youth can form nonthreatening relationships. Body language and nonverbal communication used by animals can improve children’s poor social skills and allow better communication with humans for some youth resistant to traditional treatment. Increased trust, empathy and motivation to attend therapy were also positive results of studies incorporated into this paper. Socioemotional benefits include emotional support, reduction in blood pressure, reduction in agitation and stress, and a unique distraction that may reduce the need for drug therapy (Jalongo et al., 2004).

Speech and language improvements reveal connections to A-AT as well. Animal-assisted reading programs where students read to dogs are one of the most common types of animal-assisted interventions in schools today (Siegel, 2004). Animals can be incorporated into a variety of academic areas and potentially invoke youth’s motivation to reach goals and therapeutically thrive. By engaging in real world tasks with soft, warm, touchable, and unbiased therapeutic partners, learners and participants are exhibiting roles related to constructivist theory. Animal-assisted therapy used alone or in conjunction with other interventions provides a unique avenue for individuals across a lifespan to work toward their full potential socially, emotionally, and academically.

Important behavioral and academic lessons using A-AT are increasingly being incorporated into the American school setting. Students categorized or potentially categorized at-
risk need help if they are going to succeed and interacting with animals may provide support in numerous ways (Siegel, 2004). When human attempts alone prove insufficient, A-AT could be incorporated as another means for improving the lives of youth at-risk and establishing more successful members of society.
References


