Socioemotional Benefits of Animal-Assisted Occupational Therapy with Children: A Review of the Literature and Directions for Future Research

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CERTIFICATE OF APPROVAL

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Abstract

Animal-assisted therapy has developed into a valuable tool for therapeutic interventions with children. Previous studies have targeted physical outcomes and comfort functions of animal-assisted therapy. This thesis sought to establish the extent to which evidence marshaled to date supports the hypothesis that canine and equine assisted therapy may also produce benefits in children's mental health (socioemotional) outcomes in the areas of assertiveness, competence, and interpersonal relatedness. A review of the animal-assisted therapy literature identified a general lack of research specific to this area. This said, the very limited research base relevant to this topic did provide suggestive evidence that canine and equine assisted therapy can produce benefits in socioemotional outcomes. A box-score approach was taken to organize data, and revealed positive benefits in assertiveness and competence in a small number of existing peer-reviewed studies of equine-assisted therapy, with benefits in relatedness found in both canine and equine assisted therapy. These results hint at a unique role for both types of interventions in promoting socioemotional gains. The analyses also indicated that a diverse sampling of child populations has been served by animal-assisted therapy, suggesting many potential applications. However, most documented socioemotional benefits were found in studies enrolling children with autism spectrum disorder. Finally, despite reported positive effects, many studies were limited by methodological weaknesses. The analyses undertaken in this review emphasize the need for further, more rigorous research to validate the effectiveness of animal-assisted therapy for mental health outcomes. Directions for future research are discussed.

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Introduction

Animals have had a special relationship with humans throughout history, and continue to maintain important roles in modern society. Today, animals serve various therapeutic, assistive, and supportive roles for children and adults in our society. While their service to humans has been long acknowledged and valued, the amount of empirical research on their roles in improving psychological and emotional well-being is relatively limited. This thesis will examine what is currently known about the utility of animals in supporting mental health, and outline questions for future research.

Before examining the existing knowledge base, a nomenclature outlining roles that might constitute support for mental health is needed. Animals have been differentiated and classified based on their work tasks and service use (Parenti, Foreman, Jean Meade, & Wirth, 2013), with six functional categories of animals identified: service animals; public service animals; therapy animals; visitation animals; sporting, recreational, or agricultural animals; and support animals (Parenti et al., 2013). In the nomenclature of Parenti et al. (2013), service animals are trained to perform tasks related to an individual's disability, such as a seeing-eye dog or seizure-alert dog. Public service animals are trained to assist public service professionals in their jobs, such as search-and-rescue dogs or police dogs. Therapy animals assist a healthcare professional in a therapeutic treatment. Physical therapists, occupational therapists, nurses, and other professionals may integrate therapy animals into their practice. Visitation animals are trained to provide comfort through interactions and can be found in nursing homes or schools. Sporting, recreational, or agricultural animals are trained in skills for competition, farm work, or

recreation. Examples of these types of animals include hunting dogs and agility dogs. Support animals provide physical or mental support to those in need in their homes; they are known as social therapy dogs or home-help dogs (Parenti et al., 2013).

The term 'animal-assisted interventions' (AAI) has been used to describe the broad spectrum of pursuits incorporating animals (Chitic, Rusu, & Szamoskozi, 2012). Animal-assisted interventions include animal-assisted activities, animal-assisted therapy, and animal-assisted education (Chitic et al., 2012). Animal-assisted activities (AAA) feature animals in motivational, recreational, or therapeutic activities (Chitic et al., 2012). AAA are delivered by trained professionals but are not guided by specific treatment goals (Chitic et al., 2012). Animal-assisted therapy (AAT), on the other hand, is a goal-directed intervention that incorporates an animal as part of the treatment process (Chitic et al., 2012; Zilcha-Mano, Mikulincer, & Shaver, 2011). Animal-assisted education (AAE) is also a goal-directed intervention with an animal for which the purpose is to educate, such as reading stories with a dog present (Chitic et al., 2012).

Historical accounts indicate that pets were incorporated into therapy as early as 1792 at the Quaker Society of Friends York Retreat in England, where Florence Nightingale noticed the benefits of pets in the treatment of individuals with illnesses (Velde, Cipriani, & Fisher, 2005). In 1919, the U.S. Military endorsed the use of dogs for therapy with psychiatric patients at St. Elizabeth's Hospital in Washington, DC (Velde et al., 2005). Dr. Boris Levinson noted the value of human-pet bonding in 1961 (Velde et al., 2005). In 1990, Dr. William Thomas worked to integrate the natural world, including animals, into long-term care through a therapeutic program called the Eden Alternative (Velde et al., 2005). The Journal of the American Medical Association presented the benefits of animal-assisted therapy at several health care facilities in Chicago in 1995 (Velde et al., 2005). Since then, health-care and human service professionals

have been applying animal-assisted therapy in their various fields of expertise (Velde et al., 2005). The need to develop standards of practice for credibility within the field began in the 1990s and continues today (Wilson & Turner, 1998, p. 25). Pet Partners (formerly the Delta Society) publishes *Standards of Practice for Animal-Assisted Activities and Animal-Assisted Therapies*, which offers guidelines and areas of concern in the field (Wilson & Turner, 1998, p. 25-6). This has led to an increased demand for research in the area of animal-assisted interventions.

Though a significant body of literature has examined physically stimulating and comfort functions of animal-assisted therapy, less is known about beneficial effects of these forms of intervention in promoting mental health gains. The current study was designed to provide data relevant to this issue, examining effects of canine and equestrian assisted interventions on young children's self-confidence and assertiveness and capacity for relatedness.

Literature Overview

Benefits of Animal-Assisted Therapy

Preliminary research has indicated many benefits of animal-assisted therapy. Analyses of research have revealed evidence of physical, emotional, social, and behavioral benefits of contact with animals (Wilson & Turner, 1998, p. 3). Animals may be beneficial in therapy for a variety of different injuries, disabilities, and illnesses. Overall, contact with animals has been posited to increase quality of life (Wilson & Turner, 1998, p. 3).

Physical benefits. Animals have been shown to have a calming influence that promotes relaxation (Velde et al., 2005). This may help reduce anxiety before a medical procedure and can moderate the need for medication (Velde et al., 2005). Visits from therapy dogs have produced

physiological effects of reducing stress hormones in patients (Marcus, 2013). Pet ownership is correlated with lower blood pressure (Wilson & Turner, 1998, p. 161).

Emotional benefits. As companions, animals provide emotional connections. Relationships with animals have been reported to provide comfort, increased self-esteem, and a sense of safety (Velde et al., 2005). Pets may reduce loneliness (Wilson & Turner, 1998, p. 161). Literature on the human-pet bond indicates that pets can be viewed as attachment figures (Zilcha-Mano et al., 2011). Owners report feeling emotionally close to their pets and consider their pets to provide a source of support and comfort in times of need (Zilcha-Mano et al., 2011). Animals have been known to reduce stress and improve morale for children and adolescents in a pediatric cardiology inpatient unit (Velde et al., 2005).

Social benefits. Pets have been found to be a valuable intervention tool for increasing socialization among older adults with Alzheimer's disease (Wilson & Turner, 1998, p. 204). A review of the research on animal-assisted interventions as a treatment practice for autism spectrum disorder has shown 'preliminary proof of concept' of animal-assisted interventions for autism spectrum disorder (O'Haire, 2013). More research is necessary, but reported outcomes show improvements in areas of functioning known to be diminished in autism spectrum disorder, including increased social interaction and communication (O'Haire, 2013). A study of a therapeutic horsemanship program for at-risk youth identified several skills that were gained during therapy, including self-confidence, self-esteem, self-efficacy, and empathy (Burgon, 2011). These are all skills that are utilized in positive social interactions.

Behavioral benefits. Animals can help to increase mobility and physical stamina. Senior citizens in a walking program at an assisted-living facility were found to walk further with a dog than when walking alone (Velde et al., 2005). Animals can also aid in mobility by acting as

guide dogs for the visual or hearing impaired. In a telephone survey of over 800 people, it was found that a guide dog increased mobility and led to more independence, confidence, and social interaction (Whitmarsh, 2005). Outcomes for preliminary treatments with autism spectrum disorder show decreased problem behaviors, severity of autistic symptoms, and stress when animal-assisted interventions are used (O'Haire, 2013).

Animal-Assisted Therapy in Practice

Both pet and farm animals are utilized in animal-assisted therapy. Horses, dogs, guinea pigs, rabbits, tortoises, cattle, goats, and pigs are all species that have been incorporated into animal-assisted interventions (Hassink & Van Dijk, 2006, p. 236).

AAT with children. Child psychologist Boris Levinson has been referred to as the pioneer of animal-assisted therapy with children (Friesen, 2010). During the 1960s and 1970s, he found that incorporating a dog into his therapy sessions created a relaxed environment in which the children more openly shared information (Friesen, 2010). The dog was said to be a 'social lubricant' between the therapist and the child (Friesen, 2010).

Canine therapy. The use of dogs in therapy with children is often supported because of the perception of dogs as non-judgmental beings (Friesen, 2010). Dogs therefore serve as unconditional social support for children and can encourage social interactions in a classroom and therapeutic environment (Friesen, 2010). Also, therapy dogs are believed to have a calming effect on children under stress, and may reduce verbal, behavioral, and emotional anxiety in children (Friesen, 2010). Animal-assisted therapy with dogs has been shown to lower blood pressure and heart rate when a child reads aloud and when a child participates in a slightly stressful activity like a doctor's visit (Friesen, 2010; Jalongo, 2005).

Hippotherapy. Animal-assisted therapy with horses is called hippotherapy. Therapeutic riding can be beneficial to patients with neurological and orthopedic symptoms as it helps to improve posture, mobility, and balance (Wilson & Turner, 1998, p. 43). Hippotherapy may improve motor development, motor control, and sensory issues, as these are all systems that use the movement of the horse to build 'postural control' (Wilson & Turner, 1998, p. 53-4).

Goals in AAT. Animal-assisted therapy goals may address areas such as improving motor skills; education; improving physical, mental, and emotional status; reducing anxiety or loneliness; and increasing motivation (Watts & Everly, 2009). Goals are necessary in the planning of activities for the full benefit of the animal-assisted therapy (Watts & Everly, 2009). Goals may vary based on the field of expertise of the practitioner administering the animal-assisted therapy.

Human-animal interaction. Since animal-assisted therapy involves both an animal and its human handler, some have suggested that the benefits received from animal-assisted therapy occur due to the interactions between the human participants rather than the human-animal interaction (Marcus, 2013). For example, outcomes such as increased empathy could be attributed to witnessing the handler smile during the animal-assisted therapy rather than observing a playful dog (Marcus, 2013). Several studies have compared the benefits of having a dog present versus only a friendly human for inpatients receiving cancer treatment (Marcus, 2013). In one such study, participants were randomly assigned to three treatment conditions, one which involved a therapy dog with a handler advised not to interact with the patient, another which involved a visit from a friendly volunteer, or quiet time alone reading magazines (Marcus, 2013). Therapy was reported to become easier for 70% after the dog visit, 50% after the friendly volunteer, and 20% after quiet reading (Marcus, 2013). Patients were more likely to look forward

to receiving a dog visit than a volunteer visit or reading time, and also felt more attached to the dog than the volunteer (Marcus, 2013). Since visits from both humans and animals appear to be beneficial to treatment, a combined human-animal therapy visit can incorporate the benefits of both, especially since patients seem to feel more positive about activities with an animal present. Certain benefits such as increased social interaction rely on the animal to prompt increased human interaction, demonstrating how human and animal visits can complement one another.

Animal-Assisted Therapy Precautions

Because animals are involved, there are several precautions that must be taken when implementing animal-assisted therapy into therapeutic interventions.

Health and cleanliness. The cleanliness of the animals and their environment should be maintained at all times. Animals should be bathed and well groomed before therapy sessions (Jalongo, 2005). It is important that therapy animals remain up-to-date on their vaccinations and veterinary visits to prevent the spread of disease or infection (Jalongo, 2005). Even well-trained animals can have unexpected accidents; in these situations, handlers are responsible for ensuring prompt cleanup after their animals (Jalongo, 2005).

Allergies. Allergic reactions are a concern in animal-assisted therapies. Treating animals with a dander spray prior to treatment may help reduce allergic reactions (Jalongo, 2005). Those with severe allergies would not be ideal candidates for animal-assisted therapy as the interventions may cause more harm to their health than benefit in treatment.

Safety. Safety in the presence of the animal is another concern, especially when children are involved. It is suggested that children are given age-appropriate lessons to learn how to interact with the animals prior to introducing them in the therapeutic setting (Friesen, 2010). Children should know when and how to approach the animal and should be taught to do so in a

calm and gentle manner (Friesen, 2010). The child and his or her parent must give informed consent before interacting with the animal. Cultural preferences and familiarity with animals may impact the acceptance of animal-assisted therapies (Friesen, 2010). Families may become more receptive to therapies involving animals if given the opportunity to observe the cleanliness and obedience of the animals as well as the supervision of the interaction by a qualified adult (Friesen, 2010). The type of interactions and training of the handler and animal should be clearly communicated to participants and their parents so that families can choose whether or not they would like to involve their children in the animal-assisted therapy program (Friesen, 2010).

Animal welfare. The welfare of the animals involved in therapy must also be taken into consideration. The animals should be provided with water and a resting area at all times, and should be given regular exercise breaks (Friesen, 2010). The animals should be supervised closely when given treats by visitors and must never be left unsupervised by the handler (Friesen, 2010). It is also important to monitor the animals for signs of stress to ensure their health and comfort when participating in animal-assisted therapy programs (Friesen, 2010).

Animal-Assisted Therapy in Occupational Therapy

A few studies have investigated the use of animal-assisted therapy from an occupational therapy perspective (Velde et al., 2005). Occupational therapy is the use of treatments to help people develop, recover, or maintain daily living and working tasks so they can lead independent and satisfying lives. It seeks to enable people to engage in the occupations of life, including self-care, work, and leisure. Occupational therapy focuses on everyday tasks that are meaningful to the client (Hightower, 2010). Occupational therapists work with clients of all ages who are experiencing limited functioning due to a disability, injury, or illness.

Knowledge of AAT. Surveys have revealed that the majority of occupational therapists in the United States are familiar with animal-assisted therapy or the use of animals in therapy (Hightower, 2010). Many agreed that animal-assisted therapy could be used as an effective treatment modality in occupational therapy, but few were currently incorporating animals into their treatment sessions (Hightower, 2010). Those who were using animal-assisted therapy reported it to be most effective at increasing motivation and social interactions (Hightower, 2010). A survey of occupational therapists in Ohio revealed that occupational therapists have a general knowledge of and positive attitudes towards animal-assisted therapy (Hightower, 2010). A quarter of the occupational therapists surveyed also felt there should be more research done to demonstrate the effectiveness of animal-assisted therapy (Hightower, 2010).

Attitudes of AAT. In another study that analyzed attitudes of animal-assisted therapy among farmers and therapists, therapists reported a strong general belief in animal-assisted therapy and a belief that farm animals could be effective in addition to pets (Berget, Ekeberg, & Braastad, 2008). Therapists also believed that animal-assisted therapy with farm animals could be more beneficial than other forms of occupational therapy (Berget et al., 2008). Animal-assisted therapy with farm animals was reported to be valuable for patients with serious psychiatric disorders such as schizophrenia, personality disorders, and severe depression, although it was cautioned that animal-assisted therapy should not be generalized as beneficial for all patients (Berget et al., 2008). Female therapists were more likely than males to believe farm animals could assist in improved interaction skills with other humans (Berget et al., 2008).

Role in AAT. It is necessary to determine what makes animal-assisted therapy different when used by occupational therapists (Velde et al., 2005). Occupational therapist respondents in one study reported that the role of the occupational therapist was to use the animal to ‘gain more

from the therapy' (Velde et al., 2005). To do so, the occupational therapist must have the knowledge to use the animals effectively and must develop an intervention plan that has a uniquely occupational therapy focus (Velde et al., 2005). Animal ownership, care, and interaction are all potentially meaningful occupations that could qualify an intervention as occupational therapy (Velde et al., 2005). Simply spending time with animals is considered meaningful to many people (Hightower, 2010). When an animal is present, a person can feel a greater sense of purpose in an occupation (Hightower, 2010).

Models of practice. The role of the occupational therapist is to maximize the use of the animal to obtain the best therapeutic outcomes for each individual client (Velde et al., 2005). Therefore, it is important to develop models of animal-assisted therapy that are unique to occupational therapy. This will distinguish the process and outcomes of animal-assisted therapy in occupational therapy from animal-assisted therapy in other disciplines (Velde et al., 2005). Researchers with this goal in mind found animal-assisted therapy to be compatible with a model of practice called the Lifestyle Performance Model (Velde et al., 2005). This research provides just one example of how animal-assisted therapy can be applied to an occupational therapy framework (Velde et al., 2005). The Lifestyle Performance Model focuses on five areas of a person's life, including Intrinsic Gratification, Self-care and Self-maintenance, Societal Contribution, Reciprocal Relationships, and the Responsive Environment (Velde et al., 2005). An occupational therapist qualified in animal-assisted therapy would examine the ways an animal could be applied within each domain (Velde et al., 2005). Pet-related activities that are pleasing to the client would be classified as Intrinsic Gratification; those that involve caring for the pet and its environment would be Self-care and Self-maintenance; activities that improve the pet's welfare would fall under Societal Contribution; tasks that require sharing objects or

conversation would build Reciprocal Relationships; and establishing the environment in which to interact with the animal creates a Responsive Environment (Velde et al., 2005).

Other researchers have proposed a conceptual framework that incorporates a physiological, psychological, and cognitive model to represent the deficits in functioning in students with emotional disturbances (Geist, 2011). This model was used in conjunction with Attachment Theory to identify ways in which animal-assisted therapy could be effective in treating emotional disturbances (Geist, 2011). Methodological reviews indicate a need for improved research frameworks and techniques in the field of animal-assisted therapy in order to scientifically confirm the ways in which these therapies are beneficial (Geist, 2011; Stern & Chur-Hansen, 2013).

Use of AAT. According to survey data, occupational therapists most frequently use animals in therapy with older adult and adult populations, but another 25% use animals with children (Hightower, 2010).

Animal-Assisted Therapy in Pediatric Occupational Therapy

Pediatric occupational therapists focus their work with children age birth through young adulthood (Watling, Jackson, Bondoc, Asher, & Champagne, 2010). Occupations for children and youth include activities that allow them to learn and develop, play, and care for themselves (Watling et al., 2010). Occupational therapy helps children overcome deficits that prevent them from participating fully in these occupations.

Sensory integration skills. One deficit that may be detected in children is in the area of sensory integration. Sensory integration refers to ‘the organization of sensory information for use’ (Cromwell, 2013). The ability to appropriately respond to one’s environment is an

indication of proper sensory integration. Sensory integration involves the intake, organization, and processing of sensory information by the central nervous system in an automatic manner.

Proprioception. One of the senses that must be properly integrated is proprioception, which is a discriminative sense that indicates the position and movement of the body in space. Occupational therapy can emphasize the development of proprioception through equestrian activities. Therapeutic horseback riding requires the rider to be aware of his or her body position in relation to the horse to remain balanced on the horse. The rider must adapt to the motion of the horse and respond to changes in direction and speed. Guiding a horse may provide feedback for confidence and personal competence by giving the rider a sense of control over their environment. In a pilot study measuring the effects of therapeutic horseback riding on children and adolescents with autism spectrum disorder, the effects of 10 weekly therapeutic horseback riding lessons were examined (Gabriels et al., 2012). Participants in the therapy group and a waitlist control group received baseline and post-condition assessments of self-regulation, adaptive living skills, and motor skills (Gabriels et al., 2012). The therapeutic riding group showed significant improvements on measures of self-regulation, adaptive expressive language skills, motor skills and motor planning skills (Gabriels et al., 2012). It is thought that horses may help organize or provide input to the child's sensory system (Gabriels et al., 2012).

Motor and communication skills. Occupational therapy interventions may also be directed towards improving deficits in gross motor, communication, and reading skills, all of which can be addressed through animal-assisted therapy programs with canines. Longitudinal research on the Reading Education Assistance Dogs (R.E.A.D.) program has shown that groups of 5- to 9-year-olds significantly improved their reading scores after a year of participation in the "read with a dog" program (Jalongo, 2005). Another study examined whether the presence of a

therapy dog affected the performance of gross motor tasks in language-impaired and typical pre-school children (Gee, Harris, & Johnson, 2007). It was found that children completed the tasks faster without compromising accuracy in all but one of the tasks, indicating that the dogs served as an effective motivator for certain tasks (Gee et al., 2007). Based on the results of this study and the connection between motor skills and language development, a role for therapy dogs was recommended in speech and language development programs for children (Gee et al., 2007).

Mental Health Considerations

According to standards in the mental health workforce, occupational therapy is considered one of the key professions for mental health work (Review of National Practice Standards, 2013). In response to the restructuring of the delivery of mental health services from institutions to the community, occupational therapists have expanded their role to provide individualized assessment and continuing treatment of mental health services (Lloyd, Kanowski, & Maas, 1999). The effectiveness of occupational therapy in mental health programs with adolescents has been demonstrated through decreased psychological distress following occupational therapy treatment (Kohn, Hitch, & Stagnitti, 2012).

The research presented in this review has indicated physical, emotional, social, and behavioral benefits of animal-assisted therapy, as well as a role for animal-assisted therapy in occupational therapy practice for a variety of ages and conditions. With the involvement of occupational therapists in mental health treatment, it is reasonable to consider the application of animal-assisted therapy as an occupational therapy treatment modality for mental illnesses as well. Case studies have shown animal-assisted therapy to improve depression and anxiety in psychiatric patients (Parshall, 2003). As mentioned previously, therapists hold attitudes that animal-assisted therapy is beneficial for people with schizophrenia and other personality

disorders (Berget et al., 2008). Also, animal-assisted therapy has been described through case studies as being helpful in situations of severe grief (Parshall, 2003). However, the focus of occupational therapy on improving occupational function includes a role in promoting good mental health along with overcoming the previously described situations of mental illness. Good mental health in an individual is characterized in part by the qualities of assertiveness and relatedness (Moslem, 2011; Sato, 2001). It is believed that the use of animal-assisted therapy as an occupational therapy intervention may provide a unique avenue to enhance these two aspects of mental health, particularly in children. In the early years of life, social and relationship skills are still developing and are far more malleable to focused interventions. Therefore, animal-assisted occupational therapy interventions may benefit the development of children's skills in assertiveness and relatedness.

Assertiveness. Assertiveness is the ability to state what one wants in a clear and direct manner while also respecting the rights of others (Moslem, 2011). Assertive behavior allows for the honest and appropriate expression of feelings or requests (Moslem, 2011). The four components of assertiveness include 'open expression, control of emotion, consideration for others and self-direction' (Watanabe, 2009). Assertiveness is considered an important social skill for interpersonal relationships and an individual's well-being (Moslem, 2011). It is related to self-esteem and personal competence through self-assuredness.

Relatedness. Relatedness is emotional connection and closeness with others (Sato, 2001). The goal of relatedness involves being associated with others (Sato, 2001). Relatedness is an aspect of the self that requires emotional attachment in a relationship of belonging that supports an individual's well-being (Sato, 2001). The goal of interpersonal relatedness is the

establishment of ‘close, stable, nurturing, and protective’ relationships (Shahar, Henrich, Blatt, Ryan, & Little, 2003).

The Current Study

The current study seeks to examine the role of animal-assisted therapy in producing additional benefits in mental health (socioemotional) outcomes of assertiveness, competence, and relatedness in children. The goal of this study is to identify and evaluate current studies of canine and equine assisted interventions in order to summarize the direction of effects for socioemotional outcomes. The specific aims of the study are to (a) identify the prevalence of peer-reviewed empirical evidence examining effects of animal-assisted therapy on mental health (specifically, socioemotional) outcomes, (b) summarize the target populations and methodologies of existing studies of animal-assisted therapy, and (c) provide directions for future research in this area.

Method

Protocol

The approach taken to identify extant studies that addressed the benefits of canine and equine assisted therapies for children was to document the extent to which mental health benefits were identified and examined among prior peer-reviewed publications concerned with AAT. Toward this end, an experienced research librarian at the University of South Florida St. Petersburg provided guidance in conceptualizing and performing this literature search. The study procedures were defined a priori in a protocol that specified the search strategy, inclusion and exclusion criteria, and categories for data evaluation. These details follow.

Eligibility Criteria

The following inclusion criteria were used to select relevant articles for review: (a) publication in English in a peer-reviewed journal, (b) examined animal-assisted therapy with a focus on canine-assisted or equine-assisted interventions, (c) study population consisted of children birth through age 12.

Search Procedure

Studies were identified by searching the following electronic databases from their date of origin through April 2014: *PsycINFO, CINAHL, Medline, and SPORTdiscus*. The search was limited to a patient/client population from birth to age 12. Search terms for all databases included a general subject identifier for animal assisted therapy and an identifier for canine OR equestrian focused interventions. A list of key search terms was compiled based on terms and database synonyms identified in reviews of animal-assisted interventions (Granados & Agís, 2011; Stern & Chur-Hansen, 2013). These search terms are listed in Table 1.

Data Evaluation

Information was collected from each included article regarding study population, study methodology, and examination of socioemotional outcomes. The information was classified in a box-score style approach (Green & Hall, 1984) and summarized in a narrative methodology.

Study population. For descriptive purposes, the population or diagnosis examined in each study was documented during review of articles. The terms were taken directly as they were reported in the articles. The population/diagnosis groups are listed in Table 2. Articles that did not mention a specific population/diagnosis or consisted of multiple diagnoses were recorded in the unspecified/non-specific column.

Study methodology. The design and methodology of each included study was ranked on a standardized grading system for scientific evidence. This system is utilized in occupational therapy research and was developed in evidence-based medicine (Lieberman & Scheer, 2002). Categories range from Levels I-V, with Level VI added to account for qualitative studies. Each level is described in detail in Table 3.

Examination of mental health (socioemotional) outcomes. The socioemotional outcomes examined in this study include assertiveness, competence, and relatedness. Search terms for each of the outcomes were identified prior to review of the articles; these terms are listed in Table 4. Articles were reviewed to determine if any one of the socioemotional outcomes was assessed in the study, and the direction of effects was reported. On the basis of results summarized in the articles, studies were classified as (a) indicating a positive benefit of the animal-assisted intervention on at least one socioemotional outcome and statistically significant; (b) indicating a positive benefit of the intervention on at least one socioemotional outcome that is at a trend level but is not statistically significant; (c) examining socioemotional outcomes but not indicating a positive benefit of the intervention on at least one socioemotional outcome at a trend or statistically significant level; (d) not examining whether there was a positive benefit of the intervention on at least one socioemotional outcome.

Results

Study Selection

The literature search resulted in 118 citations for consideration. Of these, 50 studies did not meet the criteria for review and were excluded from further analysis. The majority of the excluded studies consisted of anecdotes and discussions that did not meet the scientific criteria of the evidence-based grading system (16 studies). Thirteen studies were repeated among the

databases. Six were excluded because they did not relate to animal-assisted therapy or therapeutic outcomes. Studies were also excluded if they contained a combined population of children and adults (4 studies), other species of animals in addition to canines or equines (2 studies), an animal simulator (1 study), or a comparison of multiple types of therapies (3 studies). Two studies were excluded that were not available in English, and three studies could not be accessed in time for review.

The final sample included 68 articles that met the inclusion criteria of examining canine- or equine-assisted therapy with children to the evidence-based grading criteria previously outlined. The included articles were published between 1988 and 2014, with the majority of articles (54 out of 68) published in the last 10 years. The articles were published in a variety of disciplines, including journals related to occupational therapy, physical therapy, psychology, nursing, alternative therapies, rehabilitation, disabilities, child development, and medicine. Because of the extensive variety of study populations, methodologies, and outcomes in this sample, the results of the review are presented in a descriptive analysis.

Characteristics of Studies Reviewed

Each study included in the sample was evaluated for population data, methodology, and direction of effects for socioemotional outcomes.

Population results. Analysis of the study population/diagnosis found a range of groups for which animal-assisted therapy is utilized (Table 2). The most common diagnosis in the sample was cerebral palsy, which was reported in 24 of the studies reviewed. Ten studies examined the use of animal-assisted therapy with autism spectrum disorder. Children who were sexually abused were the focus of three studies, as were neurotypical/able-bodied children. The following groups were included in two studies each: attention deficit hyperactivity disorder,

emotional/behavioral disabilities, learning disabilities, medical/dental patient, oncology patient, pain, and psychiatric disorder. One study per population was reviewed for children with developmental delays, Down Syndrome, dyspraxia, hospitalization, motor impairments, movement disorders, neurological impairments, and sensory integration disorder. There were six studies that either did not specify the study population or were not specific about a single diagnosis.

Methodology results. The level of evidence based on the study methodology varied for the studies reviewed, as indicated in Table 5. The majority of studies were classified as Level III or IV, indicating an average level of scientific evidence, with 19 studies in each of these groups. Twelve articles were classified in the strongest level of evidence, Level I. The next largest group was Level V with 11 articles. Level II contained 5 articles, and Level VI had only 2 articles.

There were a total of 20 studies examining canine-assisted therapy, 47 examining equine-assisted therapy, and 1 examining both types of animal-assisted therapy. The majority of the canine-assisted studies were classified in the Level III (n=5), IV (n=6), or V (n=5) groups. The majority of the equine-assisted studies were classified in the Level III (n=14) or IV (n=13) groups, with Level I (n=10) close behind.

Socioemotional outcomes. As shown in Table 6, in categorizing the direction of effects of the socioemotional outcomes, the overwhelming majority of the studies (57 studies) were classified in category (d), which indicates they did not examine whether there was a positive benefit of the intervention on at least one socioemotional outcome. Five studies were classified in category (a), which indicates a positive benefit on one socioemotional outcome that is statistically significant. Of these five studies, four showed a benefit in relatedness, one in assertiveness, and one in competence. Two studies were classified in category (b), which

indicates a positive benefit on one socioemotional outcome at a trend level but not statistically significant. These studies showed a benefit in assertiveness and competence. In the studies that showed positive benefits for assertiveness and competence, the changes were instigated by equine-assisted interventions. Positive benefits for relatedness were instigated by both canine and equine assisted interventions. Four studies were classified in category (c), which examines socioemotional outcomes but does not indicate a positive benefit of the intervention. All four of these studies examined the socioemotional outcome of competence.

The five studies that were classified in category (a) all examined a population with autism spectrum disorder. The two category (b) studies included a population of autism spectrum disorder and cerebral palsy. The four category (c) studies consisted of populations of autism spectrum disorder, emotional disorders, cerebral palsy, and neurotypicals.

Competence was the most frequently examined socioemotional outcome, appearing in seven total studies included in this review. In the studies, competence was evaluated as spontaneous verbal communication of wants/needs, spontaneous initiations, confidence, competence, self-competence, and perceived self-competence. Four studies examined relatedness through measures of social interaction, affectionate behavior, and prosocial behaviors. The two studies that examined assertiveness evaluated verbal demands and willingness to initiate action.

Discussion

Over the past 20 years, animal-assisted therapy has developed into a valuable tool for therapeutic interventions. The majority of these interventions have targeted physical outcomes. The purpose of the current review was to examine the existing research on the use of canine and equine assisted interventions in promoting mental health (socioemotional) outcomes.

One of the primary goals of the study was to examine the prevalence of the socioemotional outcomes of assertiveness, competence, and relatedness in animal-assisted therapy interventions with children. These outcomes were chosen because they are indicators of good mental health in an individual (Moslem, 2011; Sato, 2001) and may be particularly malleable to focused intervention with developing children. Of the 68 studies reviewed, only 11 examined one of the three socioemotional outcomes targeted. This shows that despite the extensive research in the subject area of animal-assisted therapy, there is a lack of research regarding potential mental health outcomes associated with this type of treatment.

Of note, all of the studies that did examine the socioemotional outcomes of assertiveness and relatedness reported findings that were either statistically significant or approached significance (in the predicted direction) at a trend level, indicating positive benefits of the intervention. These studies also tested other physical and behavioral outcomes, raising the possibility that there may be indirect mental health benefits of animal-assisted interventions even when socioemotional outcomes are not the primary explicit focus of the intervention. The positive findings also indicate there may be a role for animal-assisted therapy interventions designed specifically to promote mental health outcomes**.** Further testing needs to be done to substantiate the current findings and increase knowledge in this area.

Also of note is the finding that while competence was the socioemotional outcome most frequently examined, four of the seven studies examining this outcome found no positive benefit of the animal-assisted interventions, while the other three studies did show significant or trend-level benefits. These mixed findings highlight the need for more intensive research in the field. Conceptually, it might be argued that personal competence and assertiveness are related to one another in such a way that increases in both traits are expected as a result of increased self-

assuredness (Moslem, 2011). In that case, we would expect to see the significant positive findings for assertiveness mirrored for competence, though the results of this study did not support this. It would not be accurate to conclude that animal-assisted therapy has no impact on competence, since several of the studies did show significant positive effects in that area. Rather, the conflicting findings may be a result of any of a number of methodological issues, including different measures that make direct data comparison impractical.

A second aim of the study was to determine which target populations have been most frequently targeted for study, and what methodologies have been used in studies of animal-assisted therapy. All studies reporting statistically significant socioemotional benefits enrolled children with autism spectrum disorders. It may be that socioemotional deficits are particularly pronounced in children with autism spectrum disorder, so targeting these deficits in this population is more clearly called for. Equally, since autism spectrum disorder was the second largest population in the review, benefits documented for this subgroup of children may have resulted in a biased interpretation about the potential benefits of the AAT. That is: it is possible that animal-assisted therapy interventions are more effective for children with autism spectrum disorder than for other populations, or alternatively, that deficits in autism spectrum children are so great that it is easier to notice and document improvements.

For the largest population represented in the AAT literature -- children with cerebral palsy -- only two studies out of 24 examined socioemotional benefits; of the two, one found trend-level effects and the other found no effects. It is surprising that so few of these studies considered the mental health benefits that may have occurred as a result of the animal-assisted interventions. Research has revealed that people with physical disabilities cite a need for mental health perspective in their treatments (Morris, 2004), so it might be anticipated that

socioemotional goals would be targeted in addition to physical goals of therapy. Clearly, more research is needed. It does seem evident, based solely on the very diverse sampling of different populations that had been served by animal-assisted therapy, that AAT has many potential applications. More empirical research is needed to determine which populations are best served with animal-assisted therapy, particularly in the area of socioemotional benefits.

Both canine and equine assisted therapies were represented in the studies that did find positive effects of socioemotional outcomes. As outlined in the results, benefits in assertiveness and competence were seen in equine-assisted therapy, and benefits in relatedness were seen in both canine and equine assisted therapy. This information highlights a role for both types of therapy in promoting mental health gains. It also suggests that certain types of animal-assisted therapy may be more beneficial for various aspects of mental health. Given the focus on physical agility and control in equine-assisted therapy, it might be anticipated that these types of interventions would have a stronger influence on assertiveness and competence, whereas the comfort and connective functions of canine-assisted therapy would more directly influence relatedness. Additional research can help determine the type of therapy that best targets each socioemotional outcome as well as other mental health outcomes that were not reviewed in this study.

Concerning limitations of this study and of the data it reviewed, it is important to recognize that animal-assisted therapy is a newer treatment modality in occupational therapy interventions. Its efficacy must be demonstrated through rigorous research and compared to alternative treatments. Current research in the field, including many of the studies reviewed in our sample, has important methodological weaknesses. One key limitation among many of the studies examined was a small sample size. A significant portion of the research in this area

involves case reports and single-subject designs. Results from such studies may not have enough statistical power to determine treatment effectiveness, and generalizability is limited. Another major limitation was lack of control conditions for comparison. More studies need to incorporate waitlist controls or randomization to an alternate treatment, which will help determine validity of the animal-assisted therapies.

Among the studies reviewed, there was often a reliance on potentially biased informants such as teachers, parents and therapists to rate children's behavior. Future research should designate blind raters of behavior and possibly incorporate reports from the children as well. This would provide a more complete portrayal of a child's mental health. For example, the construct of competence in particular might be experienced and expressed by a child but not observed by a stranger.

Research efforts would also be improved by establishment of a protocol specifying targeted activities and therapy goals. Such an effort would help standardize the treatment in research and practice. At the same time, activities in canine and equine assisted therapy interventions may differ even if the treatment goals are similar. A clear protocol would designate the specific activities for each type of therapy and identify ways to determine successful outcomes.

It may also be valuable to determine what type of formal training is necessary to implement successful animal-assisted therapy programs. Currently, a wide range of both professionals and non-professionals use animals in activities with children. However, more rigorous standards and measures of treatment fidelity are required when professionals utilize animals as part of a therapeutic treatment, and each professional follows the framework of his or her own field. Some therapists and animals may be certified in additional therapy training

programs. Future research could examine what specialized training is necessary, if any, to incorporate mental health benefits into animal-assisted therapy.

In this review, we used a broad definition of the socioemotional outcomes of assertiveness, competence, and relatedness to suit our general search. Future research should clearly define these outcomes and specify their behavioral indicators. Ideally this would lead to the establishment of reliable instruments to assess each socioemotional outcome. The use of consistent measures for outcomes would allow for better comparisons between studies using different animals, techniques, or populations.

Summary and Conclusions

Despite noteworthy limitations of the current research, previous studies have provided preliminary evidence that canine and equine assisted therapy can benefit mental health and socioemotional outcomes. There is certainly already widespread belief in the effectiveness of animal-assisted therapy, seen in study discussions and in other narrative reviews on the topic. This may be a bias reflecting a predisposition to see good given the unique relationship between humans and domestic animals. Further research is needed to provide greater empirical evidence for the use of animals in therapeutic contexts. The findings from this review offer a foundation of information for the future development and research of animal-assisted therapy programs targeting mental health in children.

Drawing stronger conclusions on the effectiveness of animal-assisted therapy for mental health outcomes calls for more rigorous, quantitative research methodologies and attention paid to use of trusted, reliable and valid instruments to evaluate outcomes, employed by non-biased observers with no vested interest in the outcome. Studies with larger sample sizes and increased frequency of assessment would result in greater statistical power. More randomized controlled

trials and control groups should be added to increase the level of evidence. Also, repeated assessments need to be conducted after withdrawal of therapy to investigate constancy of the effects over time.

In summary, the limited research base that does exist provides suggestive evidence that it may be possible to document benefits of canine and equine assisted therapy in outcomes of assertiveness, relatedness, and competence. Several studies did offer preliminary support for the notion that canine and equine assisted therapy interventions may promote mental health gains in children. More research is necessary to validate the effectiveness of these animal-assisted interventions and detail their application to occupational therapy practice. This information is vital for the development of appropriate therapeutic treatments that optimally support and maximize a child's full potential and physical and mental well-being.

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Table 1

Search Strategy for Animal-Assisted Interventions

Identifiers	**Key Search Terms**
General Subject	(animal assisted therapy), (animal-assisted therapy), (animal assisted)
Canine-specific	(canine*), (dog*), (canine assisted), (canine assisted therapy), (dog assisted), (dog assisted therapy) (pet therapy)
Equine-specific	(equine*), (horse*), (equine assisted), (equine assisted therapy), (hippotherapy), (therapeutic riding)

Table 2

Study Population Results

Population or Diagnosis	Number of Studies Reviewed
Attention deficit hyperactivity disorder	2
Autism Spectrum Disorder	10
Cerebral palsy	24
Developmental delays	1
Down Syndrome	1
Dyspraxia	1
Emotional/Behavioral disabilities	2
Hospitalization	1
Learning disabilities	2
Medical/Dental patient	2
Motor impairments	1
Movement disorders	1
Neurological impairments	1
Neurotypical/able-bodied	3
Oncology patient	2
Pain	2
Psychiatric disorder	2
Sensory integration disorder	1
Sexually abused	3
Unspecified/non-specific	6
Total	**68**

Table 3

Study Methodology Classification

Level of Evidence	**Description**
I	Systematic reviews, meta-analyses, randomized controlled trials
II	Two groups, nonrandomized studies (e.g., cohort, case-control)
III	One group, nonrandomized (e.g., before and after, pretest and posttest)
IV	Descriptive studies that include analysis of outcomes (e.g. single-subject design, case series)
V	Case reports and expert opinion, which include narrative literature reviews and consensus statements
VI	Qualitative, ethnographic studies

Table 4

Search Terms for Socioemotional Outcomes

Outcome	**Search Terms**
Assertiveness	assertive, assertiveness, expression, expressive, self-esteem, self-assuredness, autonomy, verbal demands, initiation
Competence	competence, personal competence, confidence, spontaneity, spontaneous, self-efficacy
Relatedness	relatedness, interpersonal relatedness, relate, peer relations, interactive, social interaction, affection, affectionate, prosocial

Table 5

Study Methodology Results

Level of Evidence	Number of Articles	Number of Studies Examining Canine-assisted Therapy	Number of Studies Examining Equine-assisted Therapy	Number of Studies Examining Both Canine and Equine Therapies
I	12	1	10	1
II	5	1	4	0
III	19	5	14	0
IV	19	6	13	0
V	11	5	6	0
VI	2	2	0	0
Total	**68**	**20**	**47**	**1**

Table 6

Level of Effects of Socioemotional Outcomes Results

Socioemotional Outcomes	**Category of Effects**	**Number of Studies**	**Examines Assertiveness**	**Examines Competence**	**Examines Relatedness**
Examines socioemotional outcomes	(a) Statistically significant	5	1	1	4
	(b) Trend-level	2	1	2	0
	(c) No effect	4	0	4	0
Does not examine socioemotional outcomes	(d) Does not examine	57	N/A	N/A	N/A
	Total	**68**	**2**	**7**	**4**