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The role of connection in the efficacy of animal-assisted therapies: A scoping review

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ABSTRACT

INTRODUCTION: There is an undeniable connection between humans and animals, with the relationship between the two being well documented across the centuries of history and storytelling.

METHODS: This article outlines a scoping review of the literature and research exploring the history, efficacy, and currency of animal assisted therapies (AATs) as they have developed in recent decades within human services and social work programmes.

FINDINGS AND IMPLICATIONS: Archaeological research suggests a mutualistic relationship has existed between canines and humans dating back 140,000 years evolving to deepened connections between animals and behaviourally modern humans including 15,000 years of animal domestication. These connections have generated relationships where animals both work *for* and *with* humans, assuming diverse roles ranging from service animal to companion pet, from livestock to live entertainment, from symbolic idol to science experiment and, as demonstrated in this article, as co-therapist or therapeutic medium in psychotherapeutic, human services and social work practice processes.

Keywords: Animal assisted therapies; connection; efficacy; psychotherapies; human services; social work

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This article outlines a scoping review (Sucharew & Macaluso, 2019) which examines animals as a therapeutic medium, while identifying and analysing themes from the literature and research surrounding animal assisted therapies (AATs). By exploring the disciplinary interplay between psychology, social work, physiology, biology and medicine, the theoretical and therapeutic validity of AATs is examined. The review seeks to explore the benefits of AATs and their correlation to the concept of *connection* with relation to an animal's ability to generate human–animal connections and then impact the human–human connections within a therapeutic space.

Method

A scoping review (Sucharew & Macaluso, 2019) aims to critically appraise research studies and synthesise findings, qualitatively or quantitatively. "The purpose of a scoping review is to provide an overview of the available research evidence without producing a summary answer to a discrete research question. Scoping reviews can be useful for answering broad questions" (Sucharew & Macaluso, 2019, p. 416), specifically questions which might be new to a field of endeavour or practice. This scoping review (Sucharew & Macaluso, 2019) was designed to map the existing evidence

base of AATs and their potential impact on social work programme planning, design, management, and evaluation.

Key search terms were developed and mapped and then selected databases and internet search engines were used that identified all the relevant studies (Sucharew & Macaluso, 2019). Database searches occurred via SAGE JOURNALS Premier 2019, Elsevier ScienceDirect Journals Complete, Oxford Journals Current Collection, EBSCOhost Academic Search Complete, Wiley Online Library, EBSCOhost CINAHL Complete, Highwire Press British Medical Journal Publishing Group, and Directory of Open Access Journals. Research was collated by applying the search terms "animal assisted therapy", "AAT", "animal therapy", "equine assisted therapy" and "animal assisted activities", with searches then expanding to explore theories of the "human animal bond", "biophilia hypothesis" and "attachment".

This scoping review formulated a broad research question, and identified and synthesised studies that causally relate to the question: What is the role of connection in the efficacy of animal assisted therapies? The outcome of the review was that 46 peer-reviewed journal articles, and two books were summarised and thematically analysed. The literature and research were summarised by exploring topics around the definition, theories, history, application, audience, and cultural influences evident within the research into AATs.

The research on AATs

Seeking to define the field of AATs, the literature and research presents animal assisted interventions as an overarching banner, under which AATs and animal assisted activities seemingly sit side by side. With a scientific basis in anthrozoology, also known as the field of human–animal interactions, animal assisted interventions stem from the mutualistic human–animal relationship (Yap et al., 2016). Animal assisted interventions involve a wide range of practice applications and are delivered to diverse client populations, producing a range of outcomes, including therapeutic, educational, social, and emotional (Grandgeorge & Hausberger, 2011). Lacking standardised language, there are multiple terms and definitions referred to throughout the literature and research including animal assisted therapy, pet therapy, equine therapy, equine assisted interventions, and animal assisted activities.

The lack of standardised terms and the interchangeability of language is one apparent critique evidenced within the literature (Palley et al., 2010). It is important to note here that service animals (e.g., guide dogs or seizure alert dogs) are trained for a specific purpose, living with humans as companion and providing a service. While the benefits of this connection pose similarities to those documented within AAT research, the nature of the working relationship does not fulfill the criteria to be considered an AAT.

Animal assisted activities are activities where the inclusion of an animal is focussed on play and connection (Every et al., 2017). Animal assisted activities can include hospital or nursing home visits by dogs or cats, the inclusion of a resident dog, cat or fish in rehabilitation settings, or pet visitation programmes where university students engage with a dog to decrease feelings of stress. Despite the engagement with animals providing benefits to individuals and groups, such as increased oxytocin, reduced cortisol, and social inclusion and engagement, animal assisted activities do not always set treatment plans with individual goals for clients, a clear distinction from therapeutic counterparts.

AAT is defined by Ernst (2014, p. 2) as goal-directed therapeutic interventions that include the deliberate involvement of an animal in the treatment plan for the "support and benefit of a client's social, emotional,

physical, or cognitive functioning" (see Burton et al., 2019; Chandler, 2012; Dunlop & Tsantefski, 2018; Fine, 2010; Germain et al., 2018; Lubbe & Scholtz, 2013; Nimer & Lundahl, 2007; Stefanini et al., 2015; Stewart et al., 2013; Wilson et al., 2017). AATs are delivered by individuals with relevant experience or a social worker, psychotherapist, psychologist, health, or human service professional. This facilitator holds responsibility for guiding a client through a therapeutic process with set goals and individualised outcomes (Dietz et al., 2012; Zenithson et al., 2014). There are no localised, national, or international standards regarding professional experience or qualifications for AAT facilitators.

AATs are described as being therapeutic frameworks for clients who would benefit from the inclusion of an animal because as an individual, they were having difficulty in meeting therapeutic outcomes through other treatment options (Giuliani & Jacquemettaz, 2017; Lubbe & Scholtz, 2013; Nimer & Lundahl, 2007). AATs occur across a wide range of settings, including outdoors, on farms and within therapeutic indoor spaces (Fine, 2010). AAT interventions can occur individually or within a group setting (Palley et al., 2010) and involve a wide variety of animals, including domesticated animals such as dogs, cats, and rabbits, farm animals such as horses, goats and cows, or marine animals such as dolphins (Ernst, 2014).

Equine assisted therapies or psychotherapies fall under the banner of AAT and offer interventions that target specific therapeutic or psychotherapeutic treatment goals, for example, addressing trauma and behaviour management (Germain et al., 2018). Equine assisted therapies can include the addition of a horse as a therapeutic tool into non-recreational activities which assist the client with self-development; identifying and discussing the feelings, emotions and behaviours generated through interaction with the horse. The facilitator assists the client to apply this understanding and new way of thinking to their past and future interactions with humans (Lentini & Knox, 2015; Mims & Waddell, 2016; Tuuvas et al., 2017; Wilson et al., 2017).

History of AATs

The earliest recorded history of the therapeutic use of animals was in Belgium in the 9th century, where animals engaged with people living with a disability through family care programmes (Chandramouleeswaran & Russell, 2014). Extending further, in the 11th century, patients in Belgian hospitals engaged in therapeutic interactions with birds, assuming responsibility for the care of birds during their hospital rehabilitation (Grandgeorge & Hausberger, 2011). Therapeutic use of animals continued throughout Europe with examples such as the York Retreat, a mental health asylum in England, implementing a notable programme during the 1790s providing therapeutic care opportunities for people with mental health issues. Through the introduction of domestic animals into the asylum, patients were encouraged to care for, and interact with, animals for therapeutic benefits (Brodie & Biley, 1999; Chandramouleeswaran & Russell, 2014; Grandgeorge & Hausberger, 2010; Palley et al., 2010; Risley-Curtiss, 2010). The practice of using animals as a therapeutic medium continued through the 18th and 19th centuries, with programmes being implemented in a home for epileptics in Germany during the 1800s (Brodie & Biley, 1999), the Bethel Institute in Germany introducing farm-based and equestrian centre programmes in the 1860s (Grandgeorge & Hausberger, 2010). The practice was also seen in the work and writing of Florence Nightingale in the late 1800s after she observed a reduction in anxiety in adults and children within institutional mental health care; she wrote, in her 1859 book, *Notes on Nursing*, of the positive benefits of companionship and pleasure offered by animals to patients during the recovery process (Ernst, 2014; Nimer & Lundahl, 2007; Palley et al., 2010).

Therapeutic interactions with animals continued into the 20th century with Sigmund Freud incorporating his dog, Jofi, into psychotherapy sessions after noting that Jofi altered his behaviours within the room according to the changes in a client's emotional state. In written works located decades after Freud's death, it was discovered that he utilised Jofi to facilitate communication between himself and his clients (Ernst, 2014). AATs spread to the United States with Boris Levinson, now considered to be the founding father of AATs, writing his seminal book, *Pet-Oriented Child Psychotherapy*, after incidentally observing a non-verbal child he was treating communicating with his dog, Jingles, in his absence. Further exploring this connection and based upon similar results from Jingles' engagement with other child clients, Levinson proposed the idea that animals can provide a relaxed and non-judgemental environment, assisting with facilitating a therapeutic connection between practitioner and client and subsequently increasing client motivation to participate with the therapeutic process (Ernst, 2014; Grandgeorge & Hausberger, 2011; Risley-Curtiss, 2010; Wilson et al., 2017).

The human–animal connection underpins centuries of history, mythology, spirituality, and symbolism. Spiritual and symbolic bonds are considered a "space of shared meaning and understanding" (Dell et al., 2011, p. 330). The use of animals for healing spans centuries as seen within the Ancient Egyptian and Mayan civilisations. Sacred texts from diverse traditions present a common theme of the human–animal connection with humans assuming the responsibility for the care and protection of the natural environment, including animals (Faver, 2009, p. 363). Indian mythology is full of stories based on human–animal connection with Indian gods taking the form of animals and humans transforming into animals to assist or live alongside humans, to represent the strength of the human–animal relationship (Chandramouleeswaran & Russell, 2014).

Canadian First Nations consider that the horse, through its cultural reverence, can "lead an individual to understand their place in the circle of life", based upon the connection of the spirits of the human and the horse, and using this connection to extend beyond the physical world into innate spirituality (Dell et al., 2011, p. 321). The First Nations people believe this profound sacredness within the horse is present in all living things – the interconnectedness of life. Similarly, the Pacific worldview of Va assumes a mutuality of connectedness between the "physical, spiritual, psychological, social, economic, and cultural dimensions of community" (Dell et al., 2011, p. 322), in which relationships are reciprocal rather than unidirectional between nature and man. Indigenous Australian cultures emphasise healing through connection to nature and all forms of life, experiencing an all-encompassing relationship with the land (Heinsch, 2012, p. 312).

AATs and the human sciences

The literature and research outline multiple theories from diverse disciplines, a significant amount examining AATs from biomedical, psychopathological perspectives. Assuming a social science position, a portion of the literature additionally utilises an ecological perspective, which examines the client and the intervention from the perspective of *person in environment*, identifying the bonds individuals and families have with companion animals and linking these bonds to the application of AATs as a natural extension to social practice (Fine, 2010; Legge, 2016; Risley-Curtiss, 2010; Risley-Curtiss et al., 2006).

One of the major theories presented within the literature is that of the human–animal bond. Cited in Zenithson et al. (2014, p. 69), the American Veterinary Medical Association have defined the human–animal bond as "a mutually beneficial and dynamic relationship between people and other animals that is influenced by behaviours that are essential to the health

and wellbeing of both" (p. 69). This bond has been researched within multiple disciplines including veterinary science, social work, medicine, education, and nursing (Stewart et al., 2013), expanding into the creation of centres and organisations across five countries in the 1970s and 1980s to research the interconnected ways in which humans and animals engage (Palley et al., 2010). It is through the development of a theoretical understanding of the human–animal bond that research has been able to clearly identify the benefits of interactions with animals, resulting in the inclusion of animals in therapeutic interventions based upon their deep connection to humans.

Research into the human–animal bond demonstrates that, through interaction with animals, humans experience reduced anxiety and stress, improved mood, decreased cortisol, increased social engagement, lowered blood pressure, decreased loneliness, increased empathy, improved cardiopulmonary pressure, a decrease in the use of medicines and an improvement in psychological health; with research related to psychologists and psychiatrists recommending a pet to over 50% of their patients (Ernst, 2014, p. 5; Lubbe & Scholtz, 2013, p. 117; Mims & Waddell, 2016, p. 453). Through their natural ability to create a relationship with humans, animals are stated to develop rapid levels of rapport and demonstrate empathy towards humans (Chandler, 2012; Lubbe & Scholtz, 2013). The research suggests the connection between humans and animals can replicate relationships based upon secure attachment, similar in nature to the attachment seen within human–human relationships. Animals offer "a space of safety, and a secure base" (Dunlop & Tsantefski, 2018, p. 17). While the relationship between humans and animals appears mainly behavioural, it is viewed as emotionally warm and welcoming, with participants stating that they found their therapeutic encounters with animals as non-judgemental (Stefanini et al., 2015, p. 45). The findings of Fine (2010) identify that, within therapeutic interactions, clients demonstrated increased smiling and laughter, while numerous other studies have demonstrated that children turn to their pets for comfort when feeling stressed or needing connection (Lubbe & Scholtz, 2013). The therapeutic effects of AAT are linked to the human–animal bond which provides connection based upon "pleasure, relaxation, affection, loyalty, security, love, and unconditional acceptance" (Every et al., 2017, p. 46; Risley-Curtiss, 2010, p. 40; Risley-Curtiss et al., 2006, p. 257).

One factor considered influential in understanding why humans and animals are so deeply connected is the peptide hormone and neuropeptide oxytocin located within the neural endocrine system. Secreted by the supraoptic and paraventricular nuclei of the hypothalamus, studies indicate that oxytocin is believed to be the source of the neurobiological response to interactions with animals (Giuliani & Jacquemettaz, 2017; Odendaal, 2000). Research indicates that the release of oxytocin has powerful anxiolytic effects due to an understanding that when oxytocin levels are high, the levels of the stress hormone cortisol are low, creating a physiological balance which is believed to underpin the benefits of interactions between humans and animals (Petersson et al., 2017; Serpell et al., 2017). Research has discovered that oxytocin, the hormone that enhances trust, cooperation and love between a parent and child, is released following humans spending one minute of petting dogs (Every et al., 2017; Mims & Waddell, 2016; Petersson et al., 2017).

Attachment theory is presented within the literature as an explanatory theory for examining the efficacy of AATs. The sense of connection is generated within the right hemisphere of the brain, the same area of the brain responsible for emotional processing. The literature presents research and anecdotes which refer to the attachment connection experienced between clients and therapeutic animals and assertions that the

bond of attachment is one important element in the efficacy of AATs (Balluerka et al., 2014; Dunlop & Tsantefski, 2018; Geist, 2011).

The representation of the biophilia hypothesis offers additional understanding of the deep connection between humans and animals which underpins AATs. An understanding of biophilia was first mentioned by psychologist Erich Fromm in the 1960s, linking the Latin words *bio* and *philia* to create the concept of a *love of life*. Furthering this idea and creating the biophilia hypothesis, Harvard biologist, Professor Wilson, concluded that humans have an innate predisposition to interact with the natural world, experiencing physical and psychological benefits from this connection. This perspective is supported by further research conducted within multiple disciplines including medicine, psychology, community development and architecture on the health-enhancing effects of engaging with nature (Antonioli & Reveley, 2005; Heinsch, 2012; Serpell et al., 2017). Moving forward from a dualistic perspective of humans being separate from nature to an understanding that humans form one part of nature, biophilic theorists Besthorn and Saleebey (2003, p. 2) assert that the human need to affiliate with natural ecosystems, including animals, is 'innately biological and intensely emotional'; concluding that the soul of biophilia is humanity's biological imperative to live fulfilling lives through our connection with nature (Faver, 2009, p. 363; Heinsch, 2012, p. 310). In considering the affinity evident within the literature between humans and animals, the biophilia hypothesis provides supportive evidence of the efficacy reported within AATs being based upon an innate, biological need for connection.

The theory of *attentionis egens* describes "the need for attention on a normal, basic emotional level as the prerequisite for successful social interaction" (Odendaal, 2000, p. 276). Utilising attention-need behaviour, animals and humans engage in interactions which lead to connection and bonding through feedback systems. Companion animals exhibit high levels of sociability and expression of attention-need which contributes to the success of the human–animal bond. This human–companion animal bond provides opportunities for attentionis egens, or attention-need, to be fulfilled within both sides of the relationship. It is also considered that less social animals can still fulfil the need for attention from their human owners, while the basic physiological needs of the animal are being met by the human. The efficacy of AATs may be based upon the fulfillment of attentionis egens, with the attention-need-based connection between humans and animals being expressed as a rationale for the inclusion of animals into therapeutic interactions (Odendaal, 2000).

"The connection"

A strong theme of "connection" can be identified within the literature and research, human–animal connection, human–human connection, and human–nature connection, with the research outlining the physical, psychological, and physiological benefits generated within these relationships. The importance of connection within therapeutic interventions has been well researched, with findings demonstrating that the "quality of the therapeutic alliance is the strongest predictor of treatment success, regardless of the specific intervention used" (Stewart et al., 2013, p. 330); (see also Faver, 2009, p. 369; Tuuvas et al., 2017, p. 324). It is considered that the efficacy of AATs is linked to the therapeutic alliance or therapeutic connection facilitated through the inclusion of the animal. As animals offer the client non-judgemental and unconditional positive regard, the client can form an attachment or connection with the animal before transferring this attachment or connection to the practitioner through the creation of a safe space based upon empathy, trust, and comfort (Coetzee et al., 2013; Every et al., 2017; Taylor et al., 2016).

Including an animal in the therapeutic process speeds up the generation of a therapeutic alliance, with the animal facilitating the connection and rapport between the practitioner and the client. Additionally, the animal generates connection by providing comfort to the client through touch, which further supports the therapeutic alliance and enhances the therapeutic environment without overstepping professional-personal boundaries (Chandler, 2012; Every et al., 2017; Fine, 2010; Stewart et al., 2013). The literature presents convincing evidence of the animal assuming the role of co-therapist or therapeutic medium and being a fundamental element in the creation of a therapeutic alliance based upon the varied levels of connection offered to the client.

Questions around what it is that is being done *with* and *to* animals is evident within the literature, examining the ways in which animals are utilised in therapeutic interventions. The impact on animals is discussed, with the stress levels experienced and the potential for fatigue, burnout or mistreatment expressed as areas of concern. One study examined the impact of social interactions on animal assistance dogs by examining increases in their cortisol following various interactions. Across three testing locations – the home environment, a clinic environment and within a university – the findings recorded no noticeable elevation of cortisol in the dogs tested (Zenithson et al., 2014, p. 70). Based on the power dynamic in the human–animal relationship, the integration of animals into therapy relies heavily on ethical practice which respects the animal's need for rest, reduced stress, and appropriate treatment (Munoz Lasa et al., 2015, p. 2). Recognising that animals are sentient beings, truly ethical work with animals must involve a two-way benefit for the humans and animals involved, with their needs being recognised as at the same level of importance to that of the human (Every et al., 2017). This recognition, when transferred to a professional setting, creates scenarios where the use of animals as a therapeutic medium requires ethical consideration, indicating a necessity for the reference of human–animal relationships in professional codes of ethics (Taylor et al., 2016).

The application of AATs to varied diagnoses was presented within findings related to mental health settings, correctional facilities, social care providers, residential care settings, group homes, addiction treatment centres, schools, and hospitals for the treatment or management of autism symptoms, medical conditions, physical disabilities, cognitive functioning, emotional functioning, social functioning, self-efficacy, behaviour management, and psychological conditions (Burton et al., 2019; Dell et al., 2011; Every et al., 2017; Firmin et al., 2016; Munoz Lasa et al., 2015; Nimer & Lundahl, 2007; Taylor et al., 2016; Tuuvas et al., 2017).

AATs are delivered to individuals and groups across all stages of life, with the research demonstrating studies related to children, adolescents, young adults, adults, and the elderly, of all genders. The variable nature of AATs makes them suitable for diverse applications, including short-term or long-term interventions, different environments (indoors or outdoors) and the format in which it is delivered (individual or group) (Nimer & Lundahl, 2007). Working towards pre-determined therapeutic goals, the practitioner engages the client in a series of therapeutic interventions by asking questions, encouraging positive attachment and connection, examining challenges, using metaphors applied to everyday life, assisting in problem solving, modelling communication, encouraging storytelling and narrative, or applying cognitive or behavioural restructuring techniques (Burton et al., 2019; Germain et al., 2018; Lentini & Knox, 2015; Tuuvas et al., 2017).

AATs as complementary therapy

Another theme from the research is the distinction that AATs work in addition to, and complement, other therapeutic interventions such as cognitive behavioural

therapy (CBT) and trauma therapies, rather than working as a stand-alone therapy (Dietz et al., 2012, p. 667). Examining this holistic approach, the literature further identifies the connection between the human and the animal as an important influence upon therapeutic success. A 2018 meta-analysis suggests that research overwhelmingly supports the benefits of AAT although based on many studies showing moderate effects regardless of the level of inclusion of the animal, the meta-analysis questions if the *presence* of the animal is as beneficial as the human-based interventions taking place (Germain et al., 2018, p. 161). Comparatively, one randomised, controlled trial where clients were allocated to a water-based programme based in nature versus a water-based programme involving dolphins, demonstrated significant reductions of depressive symptoms in those engaging with dolphins; further supporting the importance of an animal's presence for producing positive therapeutic results (Antonioli & Reveley, 2005, p. 3).

The literature presents a wide range of animals being utilised within AATs, with dogs and horses being the most reported. However, the complete range of animals outlined in the literature included birds, small pets and rodents (mice, rats, guinea pigs and hamsters), horses, farm animals (cows, sheep, pigs and goats), dolphins, rabbits, fish, and reptiles (Balluerka et al., 2014; Every et al., 2017; Fine, 2010; Kamioka et al., 2014; Nimer & Lundahl, 2007). Interestingly, distinctions between cultures and the selection of animals for therapeutic use was evident, with animals not common to a Western application being featured, supporting the efficacy of AATs on a global scale. Participating in research conducted in South Africa, clients engaged with giraffes, impala, a donkey, ostriches, and mongoose, or participated in activities watching lions, tigers, wild dogs, and cheetahs. It is well documented that the use of AATs is increasing globally in both application and research (Chandler, 2012; Zenithson et al., 2014).

Exploring the connection between animals and culture, the literature identifies strong cultural connections between populations of pet owners. There are high percentages of pet ownership by Indigenous cultures, followed closely by Anglo, Latino and Asian populations (Risley-Curtiss et al., 2006, pp. 265, 258). AATs are beneficial due to their flexibility to adapt to individual and cultural diversities (Risley-Curtiss et al., 2006; Taylor et al., 2016). Based upon strong cultural and spiritual connections to animals, it is reported that services which work with Indigenous peoples might experience improved service delivery through the inclusion of animals into their interventions (Risley-Curtiss et al., 2006, p. 267). Tradition within Islamic countries does not commonly include dogs as companion animals in the home, so it is stated that dogs (and possibly cats) would be unsuitable for inclusion into a therapeutic setting with this population (Every et al., p. 49). Although most of the research into AATs has been conducted from a Western perspective, there is a growing body of research appearing in countries such as South Africa, Mexico, Japan, India, and Singapore (Chandramouleeswaran & Russell, 2014; Coetzee et al., 2013; Every et al., 2017, p. 48; Loo et al., 2015; Lubbe & Scholtz, 2013).

Examining the impact of pet ownership or prior positive or negative experiences with animals, one study concluded that prior direct experience with animals has no significance to the acceptability of AATs as an intervention (Rabbitt et al., 2015, p. 346). Based upon their commonality as animal of choice, the literature deeply explores the characteristics of dogs and horses, seeking to identify what it is that makes both animals a popular choice for inclusion into therapeutic programs and interventions. It is considered that dogs are the most suitable choice due to their domestication, the ease with which they travel, the reduced requirements for specific therapeutic locations and their nature and trainability (Nimer & Lundahl, 2007, p. 235). Additionally, research into the human-animal bond identifies many humans

experience high levels of attachment to dogs, which may support their efficacy as a therapy animal (Every et al., 2017, p. 47).

Horses are considered the most suitable choice for situations where biofeedback is required. Horses, as a prey animal, have highly attuned senses which make them receptive to subtleties in the environment, including the presence of humans (Burton et al., 2019, p. 15; Wilson et al., 2017, p. 19). Research suggests that resonance underpins the human–horse interaction, providing opportunities for the participant to understand their feelings based on non-verbal feedback (Dell et al., 2011, p. 331). It is believed that horses possess the ability to respond to the internal state of the client and sense their intentions, offering insight into the client's feelings which cannot be picked up by external cues. By honing into the horse's reactions to the client, the practitioner can gain an understanding of the client's internal environment and use the sensitivities of the horse to assist clients in becoming more aware of their own internal reactions, responses, and feelings (Tuuvas et al., 2017; Wilson et al., 2017). Using metaphors during ground-based experiences, the practitioner assists the client to locate meaning in their interaction with the horse which resonates with their current psychological functioning and individual challenges (Burton et al., 2019, p. 15). This unique connection between horses and humans is utilised to attain specific therapeutic outcomes, with research demonstrating positive results with those living with autism spectrum disorder, addiction, trauma, PTSD, and populations with challenging behaviours (Burton et al., 2019; Dell et al., 2011, p. 319; Dunlop & Tsantefski, 2018; Lentini & Knox, 2015; Tuuvas et al., 2017; Wilson et al., 2017).

Efficacy of AATs

One of the success factors as outlined here, is the positive enhancement of the therapeutic environment through the inclusion of an animal. Acting as a vessel through which connection is generated and facilitated, the literature consistently presents the animal as relationship builder, mood elevator, stress reliever, and source of security and comfort (Brodie & Biley, 1999, p. 333; Lubbe & Scholtz, 2013, p. 120; Tedeschi et al., 2005, p. 64). Multiple studies report that animals "promote therapeutic disclosures and enhance therapeutic progress" (Lubbe & Scholtz, 2013, p. 120), with the presence of the animal creating a warm and inviting environment which assists clients to develop a sense of trust with the animal, which can be later transferred to the practitioner (Tedeschi et al., 2005, p. 62). Through the creation of warmth and empathy within the therapeutic environment, studies found that client retention and engagement increased, producing positive therapeutic outcomes (Dietz et al., 2012, p. 668). It is suggested that AATs are beneficial when motivation to attend therapy is an issue or concern. Legge (2016) discussed findings which indicate improved service accessibility by clients participating in AAT, concluding that clients who feel unashamed or happy to engage with therapeutic services will demonstrate increased engagement and motivation to attend (Legge, 2016, p. 1937). There is evidence which demonstrates that the inclusion of an animal into therapy increased client motivation and attendance, and decreased attrition, particularly when the therapy addressed complex and painful experiences of trauma. These findings are in stark contrast to earlier findings which indicate higher drop-out rates for trauma-based interventions, as discussed within the meta-analysis of Germain et al. (2018) which identified decreased attrition in trauma-based AAT programmes, suggesting that the animal provides additional motivation to attend and engage in the challenging aspects of trauma therapy (Germain et al., 2018, pp. 143–160).

It is considered that the connection with the animal itself provides incentive to attend therapeutic interventions, offering a solution to the barriers surrounding motivation and engagement. Research outcomes

demonstrated increased attendance rates within inpatient psychiatric programs that involve animals (Nimer & Lundahl, 2007, p. 234), increased motivation to engage with treatment for anxiety in patients with learning disabilities (Giuliani & Jacquemettaz, 2017, p. 14), and there is qualitative research which indicates that all informants in one study described the connection with their therapeutic horse as a keen motivator to attend and engage with their treatment (Tuuvas et al., 2017, p. 315). Additionally, in their case study examination of AAT in the South African context, Scholtz and Lubbe (2013) concluded that the inclusion of a dog as a therapeutic medium served as a tool for motivation as well as supporting an improvement in the creation of the therapeutic relationship between client and practitioner (p. 122). One perspective relates to the therapeutic bridge between animal and client where it is stated that, due to less complex social signals, engagement and interaction with an animal requires lower levels of cognitive processing. This results in accelerating and simplifying the connection between humans and animals, enhancing the rapid development of mutually beneficial interactions (Dell et al., 2011, p. 331; Tedeschi et al., 2005, p. 69). When animals serve as a therapeutic medium, they offer the client a transitional object to explore and develop trust and express their feelings through non-verbal interactions.

AATs are experiencing growing recognition for their potential to lead to positive outcomes for the health and wellbeing of individuals, particularly in situations where traditional talk therapies present challenges, fail to create change, or are not suitable (Firmin et al., 2016, p. 204). Providing therapeutic opportunities for clients to engage in treatment which extends beyond a traditional one-on-one, closed-door style of intervention, it is considered that AATs are successful at reducing barriers and limitations to therapy as they do not rely on language as an independent medium of change (Every et al., 2017; Wilson et al., 2017). One example of this approach in action is presented while working with at-risk teenagers, who reject therapeutic connections based upon the expectation to "talk" or to engage in conversations which explore and articulate their feelings, such as anger or sadness (Firmin et al., 2016, p. 38).

AATs are being utilised with diverse client populations with varied diagnoses and health needs. The literature presents multiple studies where AATs are applied to children diagnosed with autism spectrum disorder (ASD), producing behavioural outcomes including improved communication and increased social interaction (Nimer & Lundahl, 2007, p. 227), with equine assisted therapy/psychotherapy and animal assisted therapies involving dolphins specifically demonstrating reductions in the symptoms of autism (Chandramouleeswaran & Russell, 2014, p. 6).

Coetzee et al. (2013) identified the diversity of the therapeutic application of AATs, citing research findings related to interventions for "trauma, loss, alienation, depression, and aggressive or violent tendencies, as well as for healing sexual, physical and emotional abuse" (p. 477). In a 2007 meta-analysis, 49 studies were found to provide convincing evidence that AAT had "moderate effects in improving emotional wellbeing in non-clinical and clinical populations" (Nimer & Lundahl, 2007, p. 225). Providing a therapist's perspective, research outcomes into equine assisted therapies reported that all therapists included in the study agree that it is a powerful therapeutic intervention which provides benefits and results in shorter timeframes than traditional therapeutic interventions (Wilson et al., 2017, p. 24).

Examining the benefits of AAT begins from a space of understanding the biological, psychological, physical, and social factors which underpin health and wellbeing. The literature demonstrates evidence of positive effects experienced by humans following interactions with animals based on health,

wellbeing, and motivation (Tedeschi et al., 2005, p. 61), and presents convincing evidence of the ways in which AATs produce outcomes which demonstrate efficacy in addressing varied diagnoses and health needs from a multi-disciplinary perspective (Loo et al., 2015). The holistic nature of AATs supports their efficacy at psychological, behavioural, physical, and affective levels. Additionally, there is evidence of the suitability of AAT as a therapeutic option based upon its ability to be delivered at multiple and varied treatment locations to general and clinical populations (Firmin et al., 2016, p. 211; Hines, 2003, p. 44).

Through its ability to deliver interventions of an experiential nature rather than purely verbal processes, Tedeschi et al. (2005) identified the powerful therapeutic validity of AATs while working with families, individuals, and groups, discussing the multiple positive impacts of the therapeutic approach which influences "physical, social and emotional healing through a dynamic relationship and connection with others" (p. 62). Following positive interaction with animals, humans experience physiological and medical benefits including increased endorphins, stress reduction, increased oxytocin, decreased cortisol, decreased physiological arousal, improved heart rate, decreased blood pressure, improved sleep, improved lipid profiles, improved immunity, improved fine or gross motor skills and coordination, improved cognitive functioning, increased survival rates following surgery, improvements in physical health and lower epinephrine and norepinephrine levels (Chandramouleeswaran & Russell, 2014; Coetzee et al., 2013; Ernst, 2014; Fine, 2010; Germain et al., 2018; Gonzalez-Ramirez et al., 2013; Heinsch, 2012; Legge, 2016; Marcus et al., 2012; Nimer & Lundahl, 2007; Odendaal, 2000; Stefanini et al., 2015; Taylor et al., 2016).

In a research study examining the impact on blood pressure following visual engagement with an animal, two groups of clients were broken into those with hypertension and those with normotension. Both groups stared at a blank wall to establish baseline blood pressures before shifting their concentration to brightly coloured fish swimming in an aquarium. Within both groups, significant reduction in blood pressure was reported (Brodie & Biley, 1999, p. 333). Nimer and Lundahl (2007) identified that "young children consistently benefited across all outcome variables, including those associated with autism" (p. 234). However, it was reported that less consistent results were identified regarding the benefits experienced by other age groups, suggesting that young children are more receptive to the influence of the animal (Nimer & Lundahl, 2007, p. 234). AATs were researched for their efficacy while working with disabled populations; able-bodied populations returned stronger, more reliable wellbeing and behavioural benefits than disabled populations, although those with disabilities demonstrated stronger, more reliable "medical outcome dependent variables" (Nimer & Lundahl, 2007, p. 234).

Critiques of AATs

Critiques of AATs are related to concerns such as lack of control groups in research, small participation groups, lack of randomisation, poor outcome measures, an inability to test the hypothesis, lack of published treatment protocols and lack of theoretical frameworks to guide application (Dietz et al., 2012, p. 668; Every et al., 2017, p. 45; Nimer & Lundahl, 2007, p. 226; Palley et al., 2010, p. 202; Stefanini et al., 2015, p. 42; Stewart et al., 2013, p. 332). A lack of empirical evidence is a concern raised within the literature (Legge, 2016, p. 1928; Serpell et al., 2017, p. 224; Stefanini et al., 2015, p. 42; Stewart et al., 2013, p. 331).

In response to critiques, a few studies identified varied explanations to address the issues raised as negative or critical of AATs. Germain et al. (2018) identified that future research into AATs should be directed towards an examination of methodology, whereas Serpell et al. (2017)

emphasised that null results should not be considered as absolute demonstrations that AATs are ineffective at producing clear and consistent benefits, precisely because of inadequate sample sizes, broad outcome measures or the statistical power of differences (p. 223). Firmin et al. (2016) identified mitigating factors of success with AAT including "client needs and fears, the practitioner's abilities and desires, and the animal's nature" (p. 205). Within one study which collated practitioner perspectives of equine assisted therapy/psychotherapy, practitioners discussed the lack of community understanding and awareness regarding animal-based therapeutic interventions, identifying that the lack of community education about how it works, its use, validity and effectiveness impacts how well it is adopted as an intervention of choice (Wilson et al., 2017, p. 25). One challenge in evaluating AAT research was discussed by Germain et al. (2018) who identified the unique nature of AAT interventions and question research critiques by asking "how can one compare studies that attempt to decrease PTSD symptoms where one study has a participant teach a dog how to sit and another utilises participant/animal interactions as metaphors for relationships and life" (p.142).

Conclusions

Research which supports the efficacy of AAT has expanded across the past decade. This article outlines a scoping review (Sucharew & Macaluso, 2019) and presents research findings which replicate positive therapeutic outcomes despite variances in application and client populations. Underpinning both theory and practice, the role of connection is evidentially significant within the literature supporting an understanding that the inclusion of an animal in therapeutic settings generates and facilitates a connection which provides physical, emotional, social, and psychological benefits to client populations. Supported by theories, including attachment and the human–animal bond, and demonstrated through a scientific understanding of increased oxytocin and decreased cortisol, the positive impact afforded to client populations through the presence of an animal is strongly supported throughout the literature.

Despite the evidence which supports the validity of AATs as a therapeutic intervention, it can be stated that, in comparison to alternative therapies, AATs are still in their infancy stage of development, application and understanding. As such, there is significant scope for further research which examines the therapeutic application and outcomes of AATs across a global population. Ongoing research provides an opportunity for the further development of an evidence base which collaboratively defines AATs as a *therapy* per se, rather than an intervention which simply aims to improve connections between humans and the world around them.

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