
Animal- Assisted Interventions as a Learning Aid - A Literature Review

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ABSTRACT

Animal-assisted interventions (AAI) on learning and mental health is an evolving matter within psychology. In past history, such mediations have been held to ridicule by scholars who deemed animals to be insignificant within the field. Today, the American Humane Association postulates that the objective of AAI is a goal-directed movement, used to improve one's "social, cognitive or emotional functioning" (Ganzert, 2013). "Animal-assisted Intervention" is an umbrella term for what is traditionally known as animal-assisted therapy (AAT), animal-assisted activities (AAA), and animal-assisted education (AAE). This paper seeks to provide a comprehensive review of extant empirical research on AAI as a tool to enhance children's learning outcomes.

Introduction: *The social, emotional and cognitive applications of AAI*

Animal-assisted interventions have been shown to benefit humans in many ways. The use of equine therapy, for example, has demonstrated a remarkable improvement in individuals' abilities to recover from trauma. As Yorke, Adams, & Coady (2008) explained, the collaborative and intimate relationship formed between the animal and the patient increases risk taking behavior that contributes to the "strength, resilience and improved self esteem of the rider" (as cited in Hardiman, 2010, p. 16).

Human animal interaction has also found to be greatly beneficial in cases of depression, anxiety, and loneliness, with patients reporting feelings of "comfort" and of "happiness" (Folse, Minder, Aycock, & Santana, 1994; Garrity, Stallones, Marx, & Johnson, 1989; Siegel, Angulo, Detels, Wesch, & Mullen, 1999; Souter & Miller, 2007). Some scholars claim that such outcome is due to the perceived non-judgmental emotional support given by the animal (Allen, Blascovich, & Mendes, 2002) or indeed a sense of "unqualified love and acceptance" (Nieburg & Fischer, 1982).

Biological interpretation of this response has construed that interspecies interaction leads to an increase in concentrations of oxytocin, β -endorphin, prolactin and dopamine within the brain. Such neurochemicals are associated with a positive mood state, relaxation, and bonding (Odendaal & Meintjes, 2003). Concentrations of human cortisol (stress-related hormone) levels are also shown to decrease. The simple act of stroking a dog has been shown to reduce blood pressure in both the human and the animal, providing relaxation and stress buffering effects (Allen, 2003; Charnetsky, Riggers, & Brennan, 2004).

These findings have led to the use of animal-assisted intervention and therapy to be increasingly commonplace within long-term care facilities such as psychiatric care units (Holcomb & Meacham, 1989; Kovacs, Kis, Rozsa, & Rozsa, 2004) and care homes (Banks & Banks, 2005; Filan & Llewellyn-Jones, 2006; Kramer, Friedmann, & Bernstein, 2009), where many suffer from depression, loneliness and anxiety disorders.

This interspecies bond, however, also exhibits cognitive stimulation, which ought to show potential for its application in learning. One particularly interesting study by Edwards (2002) revealed that by seating Alzheimer's patients in front of fish tanks while they ate; their appetite and weight increased significantly (Edwards & Beck, 2002). Researchers have inferred this change to be largely due to increased mental stimulation (Scott, 2012) as well as the relative health benefits reaped from lower diastolic blood pressure (Riddick, 1985).

Other areas of animal-assisted research have extended to (but are not limited to) AAT in the rehabilitation of prisoners (Deaton, 2005; Katcher, Beck, & Levine, 1989), aid in recovery from illness and operations (Goldmeier, 1986; Sharkin & Knox, 2003; Siegel, 1993) and use of AAT in the treatment of symptoms associated with posttraumatic stress disorder, dissociation and childhood sex abuse (Lefkowitz, Prout, Bleiberg, Paharia, & Debiak, 2005; Reichert, 1998). Numerous research has previously emphasised the social benefits of animals on humans. This paper will now focus on the empirical evidence related to the role of animals

in the development of children's cognitive abilities; a topic that is given little attention and seldom practised within educational settings.

Animals' significance to children

Children's contact with animals and nature has been shrinking in the rise of urbanisation. Though in many schools "intentional wildlife experiences" persist with teachers arranging excursions to zoos, and organising activities such as tending to nature gardens, setting up bird feeders, and even having a class pet. The use of animals within schools raises questions about their impact on children's lives. A biological perspective (Wilson, 1984) is that because humans co-evolved with animals in their natural settings, children will perceptually orient toward other life forms. Wilson named this the "biophilia hypothesis". Research suggests that the human-animal relationship promotes values of nurturance and empathy, a theory of mind, and stress management while reducing symptoms of conduct disorder (Melson, 2001).

The learning environment

There has been a wide debate surrounding how academic environments affect children (Hirsh-Pasek, 1991). While some scholars have claimed that challenging pre-school children with early academic challenges stimulates learning (Storfer, 1990), others have criticized such regimental style of learning and concrete expectations during early childhood, proclaiming that these pressures can hinder performance and result in social and emotional issues (Bredekamp, 1987; Brophy, 1983; Gallagher & Coché, 1987; Kagan & Zigler, 1987).

In support of a more relaxed learning environment, advocates for animal-assisted education have postulated its utility for educational and motivational effectiveness. Malcarne (1983) writes that a shift of attention away from the teacher and towards student-centered

activities makes the material more engaging and accessible through multiple modalities (kinetic as well as visual and auditory) thus making more of a lasting impression upon students.

Stress, anxiety, and learning

Research conducted at the California Institute of Technology suggests that those in a state of relaxation are able to learn and recall information much more efficiently (Gutierre,2010). The findings produced demonstrated that when one is calm, daydreaming or in a state of “drowsiness” theta waves are produced. Research has shown that when memory-related neurons are well coordinated with theta waves during our learning process, our memories are stronger. This finding may have direct links with the use of animals in children’s learning. If the use of animals does increase concentrations of neurochemicals known to stimulate relaxation then there is reasonable cause to assume that human-animal interaction within schools could improve memory, and thus learning outcomes.

Research on the relationship between anxiety about learning performance and achievement first became ripe in the early 1960’s and results have consistently shown aninterference of anxiety on academic performance. This was seen as a “teaching problem” of the time (Rosenfeld, 1978). Though we may argue, that even by today’s standards, reducing stress in the classroom is still not broadly considered as “a teaching priority”.

A recent surge of interest has shown the introduction of “puppy rooms” within Universities to calm nerves and anxiety for upcoming exams. Within these rooms, students are able to pet and spend time with dogs brought in by staff from local shelters. The idea has proved very popular, now being utilised within Universities across the United States and, more recently, in the United Kingdom. Qualitative data obtained from interviews have shown the project to be successful in alleviating stress in students (Goldman, 2012). The use of animals in Universities was inspired by a Japanese study which showed that people

performed 44% better on tests after first viewing pictures of puppies and kittens (Nittono, Fukushima, & Akihiro, 2012). Interestingly, however, grown cats and dogs didn't have such a positive effect. Nittono and colleagues stated that this was because people found the younger animals to be more "cute" and thus were more attentive and focused on the task at hand.

As of yet, there has been very little formal, quantitative research on the impact of live animals upon revision (memory) and exam results. As stated by Anthony (2003), the educational value of classroom animals is not often appreciated or studied but offers a productive area for interdisciplinary research (Anthony, Rud, & Beck, 2003).

Motivation and learning

Conversely, lower stress levels and anxiety is not the only key to efficient learning. Studies have also noted that "motivation" is one of the greatest problems within the classroom (Cruze, 1942). Cruze notes that certain "mechanical" aspects of the learning process are influential in determining learning efficiency. He hypothesises that great care should be exercised in the selection and presentation of educational materials by utilising the "natural interests" of children.

A study conducted in California supports Cruze's assumptions (Zasloff, Hart, & DeArmond, 1999). Zasloff and colleagues conducted a mail survey which was sent to teachers to accumulate qualitative data on the use of animals upon learning within the classroom. More than 25% of the teachers were keeping either live or non-living specimens. They reported that animals and information about them were effective motivations for instruction throughout primary grades. They also reported that live animals were important for teaching children about humane values.

The social utility of animals in learning

The social utility of AAE is another area which could potentially lead to academic improvement within children. Freud (1965) was greatly interested in children's clear fascination with animals, noting how frequently they appeared in children's dreams. Freud interpreted these animals to be "projections of powerful adults" who are too threatening to appear in their human form within the dream world.

Freud himself often brought his dog "Jo-Fi" into his therapy sessions. Though originally the dog was used as comfort for the Psychoanalyst, Freud soon noticed that the dog also aided patients within their therapy sessions. He commented that children and, particularly, adolescents were generally more willing to talk openly about emotional issues when the dog was present (as cited in Fine, 2010, p. 17). Freud theorised that this was because the dog provided children with both a sense of "safety" and of acceptance.

Unaware at the time of Freud's remarkably similar discovery, Boris M. Levinson too, brought his dog to therapy sessions and discovered that children who previously had difficulties communicating, became more at ease; making real attempts at conversation when the animal was close by. Unfortunately, Levinson's novel idea for the time (1961) was considered to be a laughable concept and was not well received by the American Psychological Association. It was not until some time after Freud's death that, after gaining verification from Freud's earlier work (released in subsequent biographies of his life), Levinson published a ground breaking book on the matter entitled "Pet-orientated Child Psychotherapy" (Levinson, 1969).

Today, such ideas are more readily accepted. The idea of animals as "social agents" has been recently demonstrated in academic environments. Some schools now use therapy dogs to promote children's reading practise which has been demonstrated to improve literacy skills (Jalongo, 2005; Glazer, 1995). Based on the ideas developed by Freud and Levinson, the act of reading to dogs as (opposed to another human), dispels any anxiety, tension or

feelings of judgment from the child's point of view. Pupils have therefore reported more enjoyment from reading aloud and thus were motivated to practise more regularly (Brundige, 2009).

Bueche (2003) looked specifically at the impact of animal interventions on learning outcomes with reference to the popular American "R.E.A.D" programme (www.therapyanimals.org/R.E.A.D.html). Bueche revealed that all children who participated in the programme for 13 months, gained at least two grade levels. Some even gained as many as four levels. Similar results have also be found within other animal-assisted reading programmes (Newlin, 2003).

Animal-assisted education (AAE) has also shown the potential for significant improvement in children's writing ability. One particular primary school (located in Sussex, England) introduced an "attending school dog" named "Bertie Button". Teachers remarked that the children showed new enthusiasm and excitement for creative writing; sending cards and stories about "the adventures of Bertie Button" each week (Pearce, 2014). The teachers motivated the pupils and encouraged positive and focused behavior by providing pupils with certificates from Bertie Button such as "Well done for learning..." and "Well done, I loved your story!". These activities certainly add an element of excitement to the classroom, however, there is still great potential to cultivate further animal-assisted activities (AAA) for other challenging subjects within the school system (Nebbe, 2003).

Animals in fiction

Animal-assisted education need not always use live animals. Fictional animals are also commonly used in the classroom. Many (if not most) children's cartoons and films feature animals that portray admirable or detrimental traits that we see in humans. "Peppa Pig" and "The Tales of Peter Rabbit" are such televised programmes popular among children. Within children's books, we also see a projection of human traits onto members of the animal

kingdom. Such examples include "Aesop's fables", "The Brothers Grimm", "Winnie The Pooh" and "The Animals Of Farthing Wood" among many others. These metaphorical teachings show relation to the findings produced by Freud and Levinson. Indeed, children consistently appear to relate more closely with animals. Perhaps because children do not see them as an extension of themselves.

The "Children's Apperception Test" or "CAT" which was developed in the 1950's (Bellak & Bellak, 1950) supports the notion that animal projections facilitate children's understanding. In this test, 10 animal pictures were shown to children. Each picture exhibited the animal in a number of different social or family contexts (parental separation or prolonged illness for example) that placed the character within the context of structural family issues, role problems, and identity confusion. As predicted, the children responded more easily to the pictures of animals in these situations, than with pictures of humans in the same situation. The "Blacky Test" (Blum, 1950) delivered similar qualitative outcomes. These findings suggest that even the use of fictional animals may aid learning and understanding in young children.

The cognitive utility of animals in learning

AAT has also found a beneficial role of therapy dogs in pre-school children's "speed and accuracy" on motor skills tasks (Gee, Harris, & Johnson, 2007). In this task, 14 children (both language-impaired and controls) undertook 10 gross motor skills tasks (e.g. long jump, high jump) in either the presence or absence of the therapy dog. Results indicated that the animal was an effective motivator and increased performance accuracy in some types of tasks. Based on the connection between motor skills and language development, Gee (2007) postulated a role of therapy dogs in speech and language development programmes for young children.

Disruptive behaviour

One further challenge of academic environments is the issue of disorderly behaviour often demonstrated by children in the classroom (Emerson, 2001). Although a common feature of hormonal adolescent behavior, some individuals do present particularly disruptive tendencies that can lead to aggression, inappropriate social or sexual conduct, and even destructive behavior or self-harm. These forms of conduct can be particularly challenging and affect not only the individual but also their teachers and other students. Such distractions can have a considerable negative impact on learning (Seidman, 2005). Previous work has demonstrated that the presence of pets in the classroom can significantly improve children's ability to distinguish between the "self" and the "non-self" (Hergovich, Monshi, Semmler, & Zieglmayer, 2002). According to More (1987), "field dependence or independence" is the degree to which an individual can distinguish a figure from its background, a part from a whole, or oneself from the environment and other people". Research has stressed that the development of autonomy (a factor which differentiated field dependent from field-independent children) can be promoted through child-animal interaction (Levinson B. M., 1978; Levine & Bohn, 1986). Hergovich and colleagues noted that this sense of segregation between the self and others improved children's ability to analyse problems independently as well as become more sensitive towards the needs and moods of others within the classroom. Aggression levels also appeared to decrease in these children. It was concluded that companion animals can be an important factor in a child's sociocognitive development.

AAI has been found to increase concentration in children with pervasive developmental disorders (Farnum & Martin, 2002) and in those with attention deficit hyperactivity disorder (ADHD) (Katcher & Wilkins, 2000). Therapists observed in both cases that when the animal was present, children showed increased attendance to class, focus, engagement in learning and awareness of their social environments. Indeed, similar

behavioral changes were also observed by Koeppen (1974) with the use of “relaxation techniques”. Koeppen witnessed improved self-concept and self-belief within his subjects. Many educational psychologists postulate that self-efficacy and confidence are imperative to academic achievement and is predictive of educational attainment (Morin, Parker, Kaur, Marsh, & Guo, 2015; Rist, 1970; Rosenthal, 1973).

The road ahead

Despite the positive findings of AAI found by previous research, more empirical work needs to be done to make educational institutions and relevant policy makers interested in investing in this type of learning environment. In public institutions such as educational establishments, animals are commonly prohibited where they may be needed most – which has also been a challenging issue for research in this area. Although our knowledge of animal-assisted interventions has significantly developed over recent years, our lifestyles are increasingly becoming more urbanised. For the first time in history, people are spending little or no time with the living environment and living more insular lives through technology (Katcher & Beck, 1987).

Future research on animal-assisted education must be carefully controlled and able to demonstrate quantitative results. Although we appear to have grasped a firm understanding of the general qualitative benefits of human-animal interactions, there is very little substantial research of its direct implication for children’s educational attainment – let alone its extent. It would perhaps be useful to look at children’s individual differences and whether certain children benefit from different types of interventions involving different species of animals.

The use of animals in therapy is not suitable for all people. There are pragmatic issues to consider such as fur allergies, phobias, ethics, prior exposure to animals (Szalavitz, 2012) and possible disruption such as barking, jumping or licking which may appear intrusive to some. A fascinating review by Shibata & Wada (2010) gives insight into the uses of “animal

robots” to benefit those who cannot utilise living interventions. Interestingly, findings by Marx et al. (2010) also demonstrates improved cognitive functioning in response to videos of dogs and puppies.

Unfortunately, funding for animal interventions is to remain scarce until research provides significant and concrete empirical data to support their efficacy. Research on the topic of animal-assisted education has great scope and potential on children’s educational attainment while indeed, incorporating a sense of respect and appreciation for all life forms in everyday human life (O’Haire, 2010).

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