
Cute and Cuddly and a Whole Lot More? A Call for Empirical Investigation into the Therapeutic Benefits of Human–Animal Interaction for Children

Nicholas, R. Fawcett and Eleonora Gullone

Monash University

There are many indications that humans have a tendency to affiliate with nature, and with other living beings, including non-human species. Examples of such affiliation range from spending time in parks and nature reserves to humanising our companion animals to the point that we accord them family-member status and strongly grieve their passing. Research has also shown that humans can benefit significantly from their relationships with non-human animals. For example, studies have indicated that even the mere observation of animals can result in reduced physiological responding to stressors, and in increased positive mood. In the present review, we propose that findings such as these may provide important information regarding the potential benefits to be derived from incorporating non-human animals into intervention strategies, particularly for children. Of specific relevance for children is their fascination with, and attraction to, non-human animals. There is also the very nonjudgemental nature of human–animal interactions (i.e., unconditional positive regard) that has been argued, among other benefits, to serve as a useful “bridge” for the establishment of rapport between therapist and child. However, despite promising avenues of investigation, the area of animal-assisted intervention remains largely neglected by researchers. In this paper, we call for sound empirical investigation into proposals regarding the potential therapeutic benefits of incorporating non-human animals into intervention programs.

*“Animals are such agreeable friends
— they ask no questions, they pass
no criticisms.” (George Eliot, 1857)*

Edward O. Wilson’s (1993) biophilia hypothesis proposed that humans have an “innate tendency to focus on life and lifelike processes” (p. 1). According to Wilson, the natural environment is as central to human history as social behaviour itself. Given our species’ long history as subsistence hunters, gatherers, and farmers, it is inconceivable that the natural environment has not shaped our cognitive and emotional apparatus. Our tendency to affiliate with nature

in all likelihood enhanced the fitness of our ancestors. The brain that modern members of our species have inherited must be a product of this evolutionary process — a brain attuned to extracting, processing, and evaluating information from the natural environment (Wilson, 1984, 1993).

Humans’ Affiliation with Nature

The above line of thinking has since been drawn upon by several theorists and researchers in their examination of humans’ relationship with the natural world (e.g., Bagot & Gullone, 2001; Gullone, 2000; Katcher & Wilkins,

*Address for correspondence: E. Gullone, PhD, Dept. of Psychology, Monash University, Monash VIC 3800, Australia.
Email: e.gullone@sci.monash.edu.au*

1998). Indications of the human tendency to maintain contact with nature can be seen throughout history. The homes of the ancient Egyptian nobility, Persian settlements, and medieval Chinese villages were all marked by extensive and elaborate gardens, demonstrating that people went to considerable lengths to maintain contact with nature (Ulrich, 1993).

Fossil evidence shows that our hominid ancestors associated with canids resembling wolves, an association dating back as far as 500,000 years (Archer, 1997). Some have argued that this association may have originated with the animals' following hominids as they hunted the same prey animals (Robinson, 1995). Canids and possibly also cats may eventually have evolved to the point where they could depend on humans for food. For humans, the presence of these animals may have served the advantage of providing early warnings in the event of human conflict. That is, by pooling senses, mixed-species communities perhaps gained a competitive edge (Newby, 1999).

In more recent times, particularly the last two centuries, the provision of parks and the preservation of nature reserves have been supported by the belief that exposure to nature fosters psychological wellbeing, reduces the stress related with modern living, and promotes physical wellbeing (Ulrich, 1993). Not only are these places provided, but they are also extensively frequented. Indeed, people flock to national parks to experience natural landscapes. They travel long distances to stroll along the seashore, and wealthy people select dwellings on prominences above water or amidst parkland.

Humans' Emotional Connection with Other Species

Humans' affiliation with nature is also reflected in their expressed enjoyment in making contact with or viewing other species. For example, in the United States and Canada, more children and adults visit zoos than attend major professional sporting events combined (Wilson, 1992, 1993). In America alone, there are 40 million pet cats and 55 million pet dogs (Newby, 1999; Shepard, 1993). When considering all pets,

numbers as high as 500 million for the USA alone have been reported (Tiger, 1992).

Kellert (1993) has referred to humans' emotional connection with other species, as the humanistic aspect of our relationship with nature. According to Kellert (1993), as a social species whose extensive cooperation and affiliational ties undoubtedly had central value for survival, humans' affiliation with other species may have served the adaptive value of enhancing our capacity for bonding, altruism, and sharing. Companion animals are particularly prone to "humanisation", in that it is not uncommon for them to be assigned a relational status equal to that of other humans. For example, studies have shown that companion animals are often accorded the status of family members (Morrow, 1998), and their passing can cause significant grief. With the increasing rates of marital breakdowns, it is becoming more common for there to be custody battles over the family pets. It is also becoming common practice for people to provide for companion animals in their will.

In their review of research into companion animals, Katcher and Wilkins (1993) described support for the proposal that humans have an innate tendency to affiliate with other living aspects of their environment. Included is research demonstrating the physical benefits associated with companion animal ownership. For example, Friedmann, Katcher, Lynch, and Thomas (1980) found that pet owners, compared to non-owners, were more likely to be alive one year after discharge from a coronary care unit. Importantly, the relationship of pet ownership to survival was independent of disease severity and other sources of social support. In a subsequent epidemiological study (Friedmann & Thomas, 1995) using large samples of coronary heart disease patients, it was found that dog owners were approximately 8.6 times more likely to be alive after one year compared to non-owners. This effect was independent of other social supports available, and of the physiological severity of the cardiovascular disease.

In a more recent Australian study (Anderson, Reid, & Jennings, 1992), 5,741 people attending a cardiovascular disease-

screening clinic were also asked about pet ownership. It was found that, compared to the 4,957 non-owners, pet owners were at significantly reduced risk of coronary heart disease. Other benefits, albeit only investigated in the short term, reported to result from contact with animals include a direct effect of petting animals on human blood pressure and heart rate, and also stress-moderating or stress-buffering effects.

Even the mere observation of animals has been shown to result in reduced physiological responses to stressors and in increased positive moods (e.g., Rossbach & Wilson, 1992). For example, research by Katcher and others (DeSchraver & Riddick, 1990; Katcher, Segal, & Beck, 1984) demonstrated that watching fish in an aquarium was as relaxing for patients about to undergo oral surgery as hypnosis. Other research has shown that the presence of an animal increases social interaction among humans and also the social attractiveness of humans (e.g., Hart, Hart, & Bergin, 1987; Lockwood, 1983). For example, Lockwood (1983) found that, when showing study participants a series of scenes including one or two people, identical scenes with and without animals present generated very different responses. Specifically, the people in the scenes incorporating animals were perceived to be happier, more friendly, and less threatening.

In their attempts to highlight the salient aspects of the human-animal bond, studies (e.g., Siegel, 1990) have found that, when asked about the benefits that their pets provide, people typically describe their relationships as being characterised by feelings of companionship, security, and of being loved. Newby (1999) elaborates on these relationship qualities:

Through thousands of years of co-evolution, cats and dogs have developed an emotional responsiveness to humans unparalleled in the animal kingdom. Whether artifice or not, they often seem to hang on our every word. They respond to our signals of sadness with a lick or a flop of the tail. They purr and rub against us with every appearance of total delight when we return home. They come to us with unmistakably expressed desire for our company and make us feel as though someone cares. (p. 184)

Potential Therapeutic Pathways Requiring Empirical Investigation

Given humans' affiliation with the natural aspects of their environment and the documented physical and psychological benefits that can be derived through our interaction with non-human animals, it seems only logical to propose that psychological interventions that incorporate exposure to natural non-human elements would be more effective and/or more efficient than those that do not.

Indeed, as far back as 1969, American child psychologist Boris Levinson proposed this very same argument, resulting from a personal experience during the course of his work. Levinson was experiencing some difficulty in establishing even a preliminary relationship with a particularly withdrawn young boy he had been working with for some months. Although Levinson was usually accompanied at work by his dog, Jingles, it was his common practice to remove the dog from his consulting room before his clients arrived. However, on one particular occasion, the boy arrived early for his appointment and, for the first time, Levinson noticed the boy behaving quite differently, apparently quite fascinated by Levinson's dog. In subsequent sessions with this boy, Levinson kept his dog with him. It was not long before the boy began talking to the dog and eventually to Levinson. Jingles consequently became an integral part of Levinson's work. He found that the presence of the dog enabled more rapid establishment of rapport between himself and his clients. Levinson referred to this process as *social facilitation*.

More recently, the incorporation of animals in therapeutic interventions is referred to as *animal-assisted therapy* (AAT) or *pet facilitated therapy* (PFT), and reports similar to those of Levinson have been published. For example, Katcher and Wilkins (1998) reported the findings of a study designed to facilitate improved functioning of children with conduct disorder (CD) and attention deficit hyperactivity disorder (ADHD). They describe the study as a controlled partial crossover experimental design, in which an initial sample of 52 children was involved.

The children were randomly assigned to one of two voluntary experiences that complemented, but did not replace, their regular school and treatment curriculum. One group participated firstly in a 6-month outward bound (OB) program, and the second group participated in a 6-month nature and companionable zoo program (CZ). Each of the programs involved a commitment of 5 hours per week. At the end of the 6-month period, the OB group was transferred to the CZ condition and the CZ group was returned to the regular school program. Following their return to the regular school program, the children in the CZ group were allowed to visit their animals during their free time. According to the authors, this was the rationale for the study having only a partial cross-over design (i.e., the CZ children did not participate in the OB program following their initial program). A full cross-over design would have resulted in the CZ children not being able to visit their animals for 5 weeks, which the authors argued would have been unethical.

The CZ program was centred around a small prefabricated building that housed a variety of small animals, including rabbits, hamsters, mice, chinchillas, iguanas and other lizards, turtles, doves, chicks, and a Vietnamese pot-bellied pig. One of the educators also often attended with her dogs (number and type not specified). The children who participated in this program were given two rules: (a) be gentle with the animals (including talking softly while in the zoo) and (b) respect the animals and each other (including avoiding communications that devalued the animals or the other children).

Each child was required to choose an animal to adopt. Tasks involved in the CZ program included learning the biology of their animal, general requirements for the care of the animals, the proper way of holding them, and the particular caring requirements of the animal they chose to adopt. Other tasks included learning how to weigh and measure their animal, charting its growth, computing its food requirements, and learning to breed the animals and to care for the mother and her young. Children were also taught to demonstrate a pet to other children or to adults in geriatric or rehabilitation

hospitals. Camping trips were also included, during which the children learnt to identify indigenous birds, reptiles, and mammals. Children were free to visit the zoo and their chosen animal at any time during the week.

In comparison to children in the OB program (see Katcher & Wilkins, 1993, for details), those in the CZ program engaged in fewer aggressive behaviours post-intervention. They also demonstrated accelerated learning and decreased pathological behaviour when back in their regular school program. The authors state that "on the basis of the frequency of restraints and aggressive episodes in the regular school program 35 restraints were expected in the CZ program within the first six months. None were observed. The program was also rewarding and attendance was significantly better than in the OB program" (p. 199). In terms of formal assessment, responses on the Teacher Report Form of the Achenbach Child Behaviour Checklist (1994) at four intervals indicated that the CZ group evidenced a significant reduction in total behavioural pathology compared to the OB group. These effects were reported to carry over into the regular school program, where the treated children were less symptomatic.

The authors concluded that animal-assisted therapy and nature education has large, persistent, and broadly distributed therapeutic effects, particularly for children who display symptoms of ADHD and CD. However, the work has several complications and limitations that preclude the above conclusion being made with any confidence. Two of the most serious problems include that the CZ program involved many components, and it is impossible to determine, in the absence of a close comparison with the OB program, whether the presence of the animals had any influence on outcomes. A second major limitation relates to the empirical assessment of "success", which appears to have been totally dependent on teacher reports on the Achenbach Child Behaviour Checklist (Achenbach, 1994). Given that the teachers were not blind to the condition in which the children were participating, it is not possible to rule out a response bias.

A review of the literature reveals similarly flawed or empirically unsophisticated work. In fact, much of the reported success of animal-assisted intervention comes from anecdotal case studies or descriptive, rather than empirical, evaluations of outcomes (e.g., DeGrave, 1999; Rathmann, 1999; Roseberry & Rovin, 1999; Ross, 1999). Notwithstanding the significant paucity of sound empirical investigation into the potential benefits of animal-assisted intervention, the arguments put forth for benefits to be gained from animal-assisted interventions are consistent with findings from comparatively more empirically sophisticated research into the quality, and human benefits, of human-animal interactions (e.g., Anderson, Reid, & Jennings, 1992; Friedmann et al., 1980; Friedmann & Thomas, 1995; Siegel, 1990). As such, it can be argued that there is indirect empirical support for animal-assisted intervention. Such proposals therefore warrant methodologically sound investigation and are discussed further below.

Specific intervention applications of these proposals that appear, on a logical and intuitive basis, to be particularly pertinent include situations where the presenting problem is one of high disinhibition, as in conduct disorder (CD) or attention deficit hyperactivity disorder, and those that are the reverse, as in high inhibition or shyness. Of relevance to both extremes is the assumption that human-animal relationships are beneficial because the animals are often perceived as not being psychologically threatening (i.e., they cannot criticise or make judgements). In contrast, to humans, non-human animals can often be perceived as accepting, vulnerable, and/or dependent. Such an assumption implies that animals can promote a climate of "safety" from which a therapeutic environment can benefit. Thus, interacting with animals can provide an opportunity for emotional investment that is free of negative evaluation and not subject to feelings of rejection (i.e., unconditional positive regard). This factor of unconditional positive regard has often been proposed to be a key factor in the positive relationships that children have with their companion animals (Robin & ten Bensele, 1985).

Also referring to the benefits of the unconditional nature of the companion animal bond,

Poresky and Hendrix (1990), among others (e.g., Bryant, 1985; Levinson, 1978, 1982), have argued that companion animals provide an important source of unconditional "social" support for children. Such support has advantages over human support, given its largely non-threatening nature (Levinson, 1978, 1982).

Family environments of children diagnosed with CD and/or internalising symptomatology have been shown to be characterised by low cohesion and high conflict. Research has also shown that family climate can be associated with pet ownership. Specifically, Paul (1992) found a significant positive correlation between dog ownership and family cohesion. Paul also found that, when a pet has been acquired, there is an initial increase in the frequency of children's social interactions within the home. Further, in a survey of US families, (Cain cited in Poresky & Hendrix, 1990) found that 52% of families reported experiencing an increase in the time the family members spent together after they had acquired their pets. As many as 70% of the families reported an increase in family happiness and fun after pet acquisition. Thus, pets also appear to act as social facilitators within the family.

Of relevance to situations where the presenting problem is one of high disinhibition, Coie and Bagwell (1999), among others, have identified peer rejection as a major predictor of aggressive and hostile behaviour in children diagnosed with CD. Such children have been found to be more likely than children who do not present with CD symptomatology to attribute hostile intention to others. This has been argued to, in part, be a function of earlier peer rejection. Consequently, these increased hostile attributions lead to greater aggression over time. Given empirical findings showing that humans who are associated with animals are perceived to be less threatening and even more friendly (Lockwood, 1983), incorporating an animal into an intervention program is likely to have a positive effect, since a therapist in the presence of an animal is less likely to be perceived as having "hostile intent".

The characteristic behaviours of a child with CD reflect a conflict with other people and the physical environment. These include aggressive

behaviours that cause or threaten physical harm to other people or animals, behaviour that causes property damage or loss, or serious violations of rules (Kazdin, 1990; Lahey, Waldman, & McBurnett, 1999). From such behaviours, it is evident that these children lack understanding of the impact that their behaviour has on the environment for others. Of further relevance is a recently documented finding by Hastings, Zahn-Waxler, Robinson, Usher, and Bridges (2000), who convincingly demonstrated that concern for others, reflected in high levels of empathy, appears to play a powerful protective role against the development of externalising behaviour problems. The authors concluded that "fostering young children's attention to, and concern for the needs and feelings of others may be an effective avenue of intervention for improving the developmental trajectories of children with early-appearing externalising problems" (p. 542). Importantly, it has been proposed that empathy towards animals generalises toward humans. Paul (2000) and others (e.g., Ascione, 1992, 1997; Bryant, 1985; Poresky, 1996) have proposed that a positive disposition toward animals predicts a positive disposition toward humans. Therefore, efforts to encourage attention to, and concern for, the needs and feelings of others may be better served by incorporating animals in any therapeutic intervention.

Also, an intervention that incorporates animals, particularly one that concentrates on the appropriate handling, caring, and understanding of the animal's needs, has been proposed as a strategy for improving children's recognition of the consequences of their actions for others in their environment, and thereby causing children to re-focus their attempts at empowerment from dominating and aggressive actions to caring and gentle actions. "Taking care of animals teaches children responsibility and lets them know they count. Caring for animals can be the first step towards developing the humane ethic: a concern for other people that comes from the opportunity to love and be loved" (Ross, 1999, p. 368).

Further, Melson (1990) argued that, for children whose experiences in relationships with others have tended to be overwhelmingly dominated by a sense of powerlessness and

mistrust, providing an opportunity for control (i.e., self-efficacy) in a "safe" environment may enable the development of a sense of mastery and competence. Within such an environment, it is perhaps more likely that the often hostile relationships that children who are at risk of developing CD have with people in their lives can be transformed into positive, supportive relationships. According to Melson and others (e.g., Ascione, 1992; Ascione & Weber, 1996; Paul, 2000; Serpell, 1999), the introduction of non-human animals into intervention efforts may be the most effective means of achieving such a reframing.

Young children who experience an insecure attachment relationship with an insensitive or unpredictable parent are thought to develop internal representations of relationships that bias subsequent social perceptions and cognitions (Sroufe & Fleeson, 1986). Dodge (1991) has suggested that these negative biases may underlie the hostile attributions identified in older conduct-problem children. Conversely, secure parent-child attachment bonds can play an important protective role against the development of conduct problems in later years. Of relevance here, studies of children aged 5 years and older (e.g., Rost & Hartmann, 1994) suggest that children turn to companion animals for reassurance when feeling stressed. Thus, young children who experience an insecure relationship with an insensitive or unpredictable caregiver may benefit from an association with a companion animal. Companion animals may promote general wellbeing in conduct-disordered children through enabling the formation of secure attachment relations with another living being and thereby contributing to the child's sense of basic trust (i.e., the reassurance that one's needs will be met). Furthermore, a parent's attachment to a companion animal may indirectly affect the child through the pet's impact on the parent (Melson, 1998).

Capaldi and Stoolmiller (1999) proposed that conduct problems interfere with development of competencies, thus causing a chain reaction of failures. Learning to interact with and care for animals may provide children with an opportunity to develop a sense of competence and increase their self-esteem. Such experiences

may also potentiate learning in other contexts (Katcher & Wilkins, 1998). Moreover, animal-assisted intervention may interrupt the chain reaction of failures by providing children with an opportunity to learn in an environment that is free of negative evaluation.

Moreover, given the challenged academic performance demonstrated by children at risk of CD, and indeed their often compromised ability to concentrate on any problem for an extended period of time, increasing motivation levels is central to the success of any intervention effort. Here, too, the incorporation of animals is recommended, since research shows that children have a fascination for, and curiosity about, animals (Wilson, 1984). For example, research involving people with intellectual impairments has shown that animals appear to increase the attention span of such participants (Nathanson, 1989; Netting, Wilson, & New, 1987).

It is important to note that, although the above discussion has been primarily focused on problems of under-control (i.e., externalising), proposals put forth for the benefits of animal-assisted intervention are also relevant to situations where the presenting problem is one of over-control or high inhibition (i.e., internalising symptomatology).

In relation to the latter symptomatology, animal-assisted interventions have been associated with reduced state anxiety levels (Barker & Dawson, 1998). This research involved a pre-treatment and post-treatment crossover study design to compare the effects of a single animal-assisted intervention session with those of a single regularly scheduled therapeutic recreation session. The authors found that the animal-assisted session was associated with significant reductions in state anxiety levels for participants with mood disorders, psychotic disorders, and other disorders (including anxiety, cognitive, personality, and somatisation disorders). In contrast, a routine therapeutic recreation session was associated with significant reductions in state anxiety levels only for participants with mood disorders.

As proposed by Roseberry and Rovin (1999), human-animal interactions can help to reduce withdrawal and avoidance behaviour through the animal's tendencies to predictably

and instinctively react positively to positive stimuli. Also, as noted by Mason (1997), non-human animals display emotions more purely and more intensely than do humans. With specific reference to dogs, Mason wrote:

Can anyone be as joyous as a dog? Bounding ahead, crashing into bushes while out on a walk, happy, happy, happy. Conversely, can anyone be as disappointed as a dog, when you say "no, we are not going for a walk?" Down it flops onto the floor, its ears fall, it looks up, showing the whites of its eyes, with a look of utter dejection. Pure joy, pure disappointment. (p. 23)

Also relevant to the internalising disorders, are unconditional positive regard as well as acceptance, which may help to promote an increased sense of self-efficacy and trust in others, as well as reduced feelings of rejection and inadequacy. The "social lubricant" role played by animals in social situations would undoubtedly be invaluable in promoting a therapeutic environment conducive to openness and emotional expression (cf. Levinson, 1969). Clinical exchanges may also benefit from the example of non-human animals' spontaneity of emotional responding, and thereby work against the over-controlled behaviours of children with internalising tendencies.

Conclusions

Given the above discussion, on first glance it seems surprising that the potential benefits of therapeutic interventions incorporating non-human animals have not been more extensively researched and utilised. Reasons for such neglect possibly include the lack of available empirical evidence to support proposed benefits. A general bias against the value of non-human animal interactions for human psychological wellbeing may further explain the lack of empirical interest in the area. Thus, one bias perpetuates the other, as in: there are no empirical data so the relationship must not be important, and the relationship is only anecdotally supported so is probably not worthy of empirical investigation.

In conclusion, and as cogently summarised by Serpell (1999):

We should endeavor to understand the experiences and needs of children within the social and cognitive environment to which they are uniquely adapted. If interactions with animals are as attractive and important to children as they appear to be, then it is the height of adult arrogance to assume that child-animal relations are somehow irrelevant to normal development. In fact, given the evolutionary history of our species and its overwhelming dependence on other animals as food, workers, companions, religious icons, symbols, and exemplars, it would be surprising if children evinced no spontaneous affinity for animals. (p. 92)

We extend Serpell's statement by arguing that, given children's, and indeed the human species' attraction to non-human animals, and given the enormous potential therapeutic benefits to be gained from the incorporation of non-human animals into therapeutic interventions, it is to the detriment of our science and practice that we continue to neglect such opportunities.

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