



WALTHAM[®] pocket book of human-animal interactions



Edited by Dr. James Serpell
and Dr. Sandra McCune



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WALTHAM® pocket book of
human-animal
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Foreword

Anthrozoology – a growing discipline

Anthrozoology, the study of human-animal interactions (HAI), is a relatively young discipline. I was lucky enough to enter the field in 1979, in its early years. Now, more than 30 years later, I am delighted to report that anthrozoology is enjoying what I would call a productive adolescence supported by a healthy body of original research, much of which is summarised in this excellent WALTHAM® pocket book.

Looking back, it is clear that the field has confronted a number of significant obstacles on its path to maturity. Research in anthrozoology is not easy. Cross-sectional comparisons of pet owners and non-owners inevitably run up against the problem of causality. For example, are the observed health differences between owners and non-owners really due to the pet, or are pet ownership and better health related independently to some other unknown factor to do with the kinds of people who choose to acquire pets? It is also hard to design empirical studies to demonstrate the value of pet ownership or animal-assisted interventions using traditional research methods.

The 'gold standard' of clinical research, the double-blind placebo-controlled trial, is obviously not feasible, and identifying appropriate control groups for comparison is invariably challenging. While most established disciplines are underpinned by relatively coherent bodies of knowledge and theory, and by well-defined methods of investigation, the study of HAI really began with an idea – that animal companionship might be good for us – and then attracted an unusually interdisciplinary mix of scientists and scholars who applied an equally eclectic range of concepts, theories and methodologies to the problem. This characteristic of the field was part of what made it appealing and challenging to those of us involved, but it may also have appeared unfocused or insufficiently rigorous, especially when viewed from the perspective of more mature and established disciplines. This perceived vagueness or lack of rigor has probably contributed to the slow pace of acceptance of HAI research findings within mainstream biomedical science and practice.

Until very recently, the field has not identified plausible mechanisms for the reported benefits of animal companionship. Fortunately, recent studies of mammalian attachment systems suggest a possible role for the hormones, oxytocin and arginine-vasopressin, in the formation of human-animal bonds, and in the ability of these bonds to protect or buffer us from the debilitating effects of stress.

Much work in this area still remains to be done to unravel the biological basis of the so-called 'human-animal bond'. This approach may help to explain some of the remedial and therapeutic effects of animal-assisted interventions. Experimental manipulations of brain levels of oxytocin have been shown to induce expressions of trust and compliance in human subjects. Since both trust and compliance are necessary precursors to success in most forms of counselling and therapy, this may help to account for the value of incorporating animals as therapeutic adjuncts.

Perhaps the greatest barrier to the development of anthrozoology as a field has been the general scarcity of funding for research. Success in biomedical research is typically measured in terms of peer-reviewed publications in high-quality scientific journals, and by the ability to secure long-term research funding from government-supported granting agencies.

Since its beginnings, the field of HAI has been sustained mainly by generous but sporadic funding from the pet food industry. While it is likely that it could not have developed at all without this support, the field's dependence on limited amounts of short-term corporate funding has restricted the type and scope of research conducted, raised doubts about the credibility of some important findings, and discouraged young researchers from seeking to pursue careers in this area. By its implicit acknowledgment that the study of HAI is now officially worthy of taxpayer support, the recently established public-private partnership between WALTHAM® and the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development is therefore a significant landmark, and an exciting new opportunity for the field.

Certainly, a great many important questions still remain to be answered, many of which are discussed in the pages that follow. In the area of animals and human health, there is a need for long-term, prospective studies that examine why some human-pet relationships are more or less beneficial than others. In other words, why some of these relationships tend to end prematurely in abandonment, euthanasia or shelter relinquishment for the animal partner, while others evoke profound feelings of loss and bereavement long after the animal's demise. Can the quality of these different relationships be related to their benefits? And what is the contribution of the individual animal's temperament and behaviour to the durability and impact of these attachments?





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Seeking answers to questions like these will help to move the discussion beyond simplistic positive or negative characterisations – for example, pets as universal panacea versus pets as social parasites or inferior ‘substitutes’ for interpersonal relationships – towards a more nuanced understanding of both the benefits and challenges of these unique human-animal partnerships. Consideration should also be given to the possibility that the health benefits of pet ownership are cumulative over the lifetime of the individual, and may be difficult to detect from the short-term perspective of most studies.

The role of companion animals in human development also deserves more attention. For example, while a number of studies have shown positive effects of pet ownership on the development of children’s empathy and prosocial skills, we still do not know whether all children benefit from these interactions with pets, or if the effects are mediated by other factors such as the age, sex, and circumstances of the child.

There are theoretical evolutionary reasons for thinking that preadolescent girls might be preferentially attracted to the nurturing opportunities provided by pets¹, but it remains to be seen whether this group of children derive greater or more enduring developmental benefits from their interactions with animals than do others.

Finally, the overwhelming majority of published HAI studies have been conducted in Europe or North America where people’s attitudes to, and relationships with, animals may be quite different from those in other parts of the world. As emphasised in this volume, new research is therefore needed to explore both the similarities and the differences in human-animal interactions cross-culturally.

In spite of the challenges it has encountered along the way, anthrozoology continues to flourish and now seems poised to enter a new and exciting phase of its development. This timely and informative WALTHAM® pocket book provides the perfect state-of-the-art introduction to the field, as well as a valuable guide to where it will likely be going in the future. The authors are to be congratulated for producing such a remarkably succinct and readable synthesis.

James A. Serpell, MA, PhD

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For nearly 50 years, WALTHAM® has been a leading authority within the field of pet nutrition and care. WALTHAM® science and publications have been instrumental in helping define the nutrient requirements of companion species and understanding the special relationship between pets and people.

WALTHAM® scientists work in partnership with the pets at the WALTHAM® Centre for Pet Nutrition to conduct pet-focused research to support Mars Petcare. WALTHAM® delivers scientific breakthroughs in the areas of pet nutrition, health, well-being and behaviour. In collaboration with global, scientific institutes and experts, the WALTHAM® team of carers, scientists and trainers supports leading Mars Petcare brands such as Whiskas®, Pedigree®, Trill®, Cesar®, Sheba®, Kitekat®, Aquarian®, Winergy®, Nutro®, Royal Canin and Banfield®.

Today, having pets share our lives is becoming more important than ever. Smaller households due to factors such as family breakdown and separation, and a growing aged segment of the population, mean pets are even more important for healthy child development at one end of the age spectrum and for healthy ageing at the other. The public-private partnership established between the WALTHAM® Centre for Pet Nutrition and the Eunice Kennedy Shriver National Institute of Child Health and Human Development is one example of how high quality research in this field is expanding with greater credibility and reach across disciplines.

This booklet aims to provide a valuable introduction to human-animal interactions for everyone interested in pets, from people sharing their lives with pets to those working within the pet food and related industries.

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Introduction

A mutual and dynamic relationship

Humans have depended on animals since the dawn of our species, but it is only recently that a field of study, known as anthrozoology, has emerged to help us better understand people's relationships with animals. Anthrozoology, the study of human-animal interactions (HAI), seeks to examine the full range of people's associations with animals, including wildlife, pets, therapy, agricultural, zoo and laboratory animals.

This booklet focuses exclusively on companion and therapy animals, while recognising that interacting with animals in wild settings, zoos and on farms can be both joyful and beneficial. In this context human-animal interaction refers to the mutual and dynamic relationships between people and animals and the ways in which these interactions may affect physical and psychological health and well-being of both people and their pets. This concept has also been termed the human-animal bond (HAB) or the human-companion animal bond (HCAB).

The study of HAI is rapidly expanding. This pocket book will provide the reader with an overview of the field, the many areas and issues being investigated and a snapshot of the most recent research related to the potential health, social and emotional benefits of animal companionship. It will introduce areas of continued and emerging inquiry, such as the partnering of professionals with pet species to deliver therapeutic benefits, the benefits of pets to communities, the health benefits of pet ownership and the role that dog walking can play in promoting physical activity and healthy weight management in both pets and people.



An ancient association

Thousands of years with man

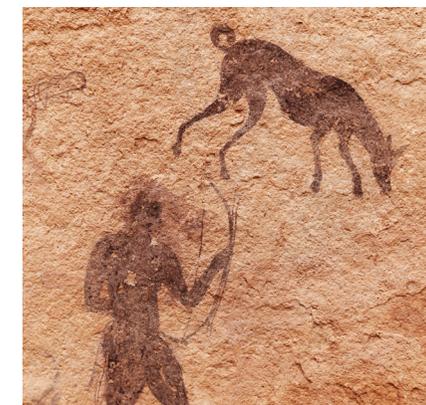
Animals have been a central feature of human life for many thousands of years. We know that from the earliest human times, wild animals and, later, agricultural animals have been important for the provision of food and other materials, transportation, and as part of cultural and religious practices. Keeping animals as pets, while often thought to be a modern practice associated with Western affluence and materialism, is in fact neither new nor primarily Western. Evidence suggests that pet keeping has been practised continuously throughout human history².

Some of the oldest known archaeological remains of domestic dogs buried with humans have been found in Israel and Northern Europe, and are estimated to have originated 11,000 –14,000 years ago.

Similar dog-human burial sites have been found in the North American Midwest, suggesting that Native Americans may have kept pet dogs more than 8,000 years ago. Burial evidence from the Mediterranean island of Cyprus provides support for the idea that cats, long believed to have been first domesticated in ancient Egypt approximately 4,000 years ago, have been the close companions of humans for at least 9,500 years.

Ample evidence exists to support the popularity of pets in ancient Egypt, Greece, and Rome, and to establish that dogs and cats were frequently kept as pets in the imperial households of both China and Japan.

Therefore, when one considers that pet keeping only received wide acceptance in Europe and North America in the mid to late 18th century (less than 300 years ago), it becomes clear that our current relationships with companion animals are just the most recent expression of an ancient and enduring bond between people and pets.





Pets and healthy child development

Social, emotional and health benefits

Contact with pets is emerging as a significant source of support and well-being for people of all ages. Pets may, however, have a special role in healthy child development. Given changing demographics, including divorce rates and the decreasing size of families in many developed countries, pets may take on even greater social and emotional importance within families. One startling statistic is that US children are more likely to grow up with a pet than with a father in the home.

In developed Western societies there is a cultural belief that pets are beneficial to children. They are thought to teach responsibility, build empathy, and promote concern for animals and the natural world. Families with children under 18 make up nearly 40 percent of all pet owners in the United States, and animals figure prominently in children's toys, books, games, movies and television programmes. Science is just beginning to more rigorously examine the many roles that pets play in children's health, development and well-being.

Studies show that animals can act as 'stress buffers', for example they may ease the distress associated with anxiety provoking experiences, decrease the perception of physical and emotional pain, and dog ownership in particular may promote healthier, more active lifestyles.



Pets as family members

One aspect of socio-emotional development that has received a great deal of attention involves the bonds that children form with pets, and the resultant social support that these relationships can provide.

When asked, both children and parents describe pets as 'members of the family', and children will often refer to them as their 'best friends'. Many children turn to their pets for support and comfort.

One study found that 75% of participating 10-14 years olds sought out their pets when they were upset³. Another, conducted in the UK, found that children often ranked pets higher than certain human relationships within their social networks, and that dogs and cats were viewed as confidantes, as well as providers of comfort and support⁴.

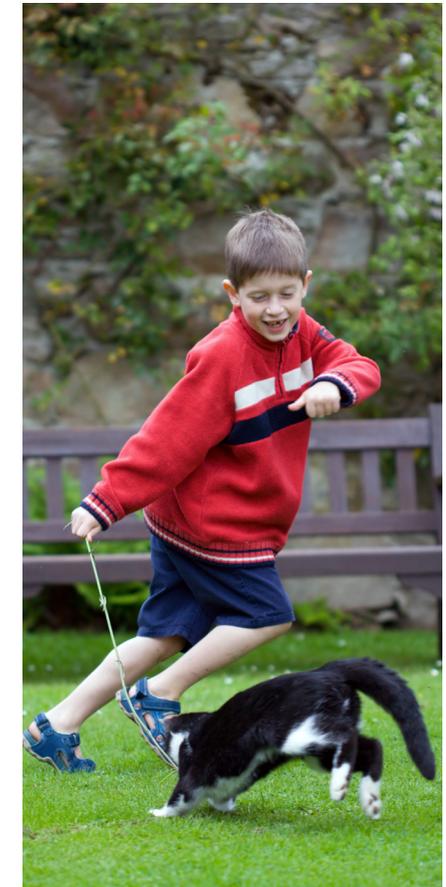
Close relationships with dogs and cats have also been linked to the development of empathy (i.e. the ability to identify with the feelings of another and 'put oneself in their place') and more positive behaviour among children (i.e. acting with the intent of benefitting others).

While much remains to be learned about the role that pets play in children's social and emotional development, it is known that children without younger siblings are more likely to own pets, and parents have reported that these children also engage in more play and caretaking activities with their animal companions⁵, suggesting that the youngest or only children may receive the most benefit from having pets at home.

Reducing stress

The availability of social support plays an important role in the health of adults (see page 9), and it has been suggested that pets and other animals can also provide this type of support to children. Decreasing stress can have immediate, positive effects on heart rate and blood pressure for children and adults, and the presence of animals has been shown to produce these effects among people at all stages of life, and over a variety of contexts. An animal's ability to provide non-judgmental social support has been offered as one explanation for the calming effect of animal presence. Healthcare visits can be stressful to children and early negative experiences can lead to the development of longer-term fears that generalise to other situations. The presence of animals has been found to calm children in these types of anxiety-provoking situations.

When combined with the reported ability of even brief interactions with a dog to decrease both physical and emotional perceptions of pain in children who have recently undergone surgery (1-3 days prior to interacting with the dog)⁶, these findings suggest that contact with animals may be beneficial to child health and well-being in tangible and measurable ways.





Promoting healthy lifestyles

Pets play an important role in promoting healthy lifestyles in terms of physical activity and healthy weight management. Childhood physical inactivity and obesity are growing public health concerns worldwide, and up to one third of children in developed countries can be categorised as overweight or obese. In addition to the social stigma that being overweight can carry, it puts children at increased risk for developing a number of health problems, including Type 2 diabetes, cardiovascular disease, and liver problems.

Pets, and dogs in particular, can help promote physical activity simply by their need for exercise and their desire to play. Some studies have reported higher levels of physical activity in children from families with dogs⁷, and a study in Australia found that young children (5-6 years old) from families with dogs were less likely to be overweight or obese⁸. Research has also shown that pregnant mothers who own dogs are more likely to meet national guidelines for physical activity through walking their dog⁹.



Cognitive development

The role of animals in children's cognitive development, including aspects such as perception, reasoning, decision making, attention, memory and the acquisition of language, is also an active area of scientific inquiry. In the field of human-animal interactions, a popular theory termed '*biophilia*' suggests that humans may be hardwired to attend to animals and the natural world.

Selective attention to animals and nature was probably essential to early humans, whose survival depended on their ability to locate resources, track prey and avoid predators. This may help to explain why interventions that utilise animals appear to be motivating and beneficial for some children (e.g. those with disorders of attention, such as attention deficit hyperactivity disorder (ADHD))¹⁰, and may also support the inclusion of animals and animal imagery in education.

Language development

The role of animals in the development of language is uncertain, but it is interesting to note that studies have found 'dog' and 'cat' to be some of the most frequently occurring words in infants' vocabularies¹¹. These terms are also the ones children search for most commonly in encyclopaedias¹². In a study of Dutch children's internet usage, 'seeking information about animals' was among the four most common descriptions of positive experiences with the internet¹³. These findings may provide further support for the existence of an innate human interest in animals, and demonstrate the power of animals to motivate and stimulate children's interest in learning.

Allergies and Immunity

There is evidence to suggest that childhood exposure to dogs and cats may decrease the likelihood of developing certain kinds of allergic reactions to them later in life, and having pets in the home has also been linked to enhanced immune function in children, as evidenced by better school attendance rates due to fewer illness-related absences¹⁴. This benefit to school attendance is thought to result from children in pet-owning households having their immune systems 'primed' by exposure to microbes from pets. This effect was particularly strong for younger children (ages 5-8 years), and in some cases amounted to nearly three extra weeks of school attendance for children with pets¹⁴.



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Health benefits

Promoting physical and mental well-being

Sharing the ups and downs of life with a pet can help people stay happier and healthier. Some of the strongest evidence for the health benefits of pets has come from research on cardiovascular health, physiological arousal (the stress-moderating effect of animals), depression and anxiety, and social support¹⁵. In 1980, a groundbreaking study showed that there was a significant positive association between having pets and one-year survival after hospitalisation for certain kinds of heart disease¹⁶. Many psychosocial variables were assessed, but only pet ownership and social support emerged as independent predictors of one-year survival after a heart attack¹⁷.

So what is it about relationships with animals that create these beneficial health effects? One well-supported theory is that pets provide social support, and this support acts as a buffer against the stresses of everyday life¹⁸⁻²⁰. People who share their homes with pets have healthier physiological responses to stress, including lower baseline heart rate and blood pressure, and demonstrate less cardiovascular reactivity to, and faster recovery from, mild stressors^{18,19}.

Pet ownership and animal-assisted interventions have also been shown to help people cope with the psychological effects of stress^{21,22}. For example, in a sample of men infected with HIV, those who had pets reported less depression, especially if they had less social support from other sources²¹.



In addition to producing a cardiovascular response, chronic psychosocial stress also increases the body's release of the stress hormone, cortisol, which in turn suppresses immune function¹⁵. Several studies have found that interacting with pet or therapy dogs is associated with reductions in cortisol^{23,24} and self-reported anxiety²⁵.

Recent work on the hormonal basis of the human-animal bond has shown oxytocin peaks in both people and their dogs when they interact positively. This 'feel good' hormone is also released when people are in close physical contact (e.g. interactions between mother and infant), and suppresses the production of cortisol.

This reduction in stress hormones may explain the feelings of relaxation that relationships with animals can produce²⁶.

For people who enjoy animals, and especially for those with limited social support, relationships with dogs and cats can help them cope better with stress, and can be healthy, supportive and enjoyable adjuncts to medical treatment.



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Pets and healthy ageing

Supporting quality of life

In developed countries, increasing proportions of the population are made up of older adults. Advances in treating disease, as well as in knowledge and education about nutrition and healthy lifestyles, are at least partially responsible for this increase in longevity. 'Healthy ageing' is about retaining independence and quality of life by preserving physical, mental and social well-being.

People in developed countries can now expect to live nearly 80 years without significant disability, and women in particular may do so with no limitation on their ability to care for themselves. In the US, the majority of people over age 65 live independently, and an estimated 14% share their lives with pets²⁷. Pets can be a strong motivator for elderly adults to remain active, to get outside and to retain functionality. Caring for a pet can provide a strong sense of purpose.

Not surprisingly, many of the benefits of interacting with animals that have been reported in children and adults are also relevant to older adults. Certainly, the findings associating pet ownership with one year survival after a heart attack become even more important as one advances in age¹⁷.



The value of social support from pets may be even more relevant for older adults because, as one ages, social networks and the support they provide may become weaker. In older adults with fewer social contacts, one study found that those having a strong attachment to a pet reported lower rates of recent illness than those who were less attached²⁸.

Older adults with dogs tend to be more physically active than those without and retain their physical activity for longer²⁹.

Those without dogs can become more physically active by walking with shelter dogs, or with volunteer handler/therapy dog teams. Results from such programmes have demonstrated improvements in walking speed and distance for older adults, with participants reporting that the dogs serve as motivators for continuing in the programme more than walking with a human companion³⁰.



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Pets in society

Benefitting the community

Anyone who has walked a dog in a city or suburb will recognise that pets get people talking to one another. Animals are powerful catalysts for positive social interaction across many different contexts, and have the ability to create connections that transcend racial, cultural, physical and socioeconomic differences. Stopping to chat with other dog owners or meeting up at the dog park are great ways to get to know neighbours and help build healthier communities that are better connected, safer and more pleasant to live in.

Research into the community benefits of pets has focused on the concept of *social capital*. Social capital can be somewhat difficult to define, but it has been referred to as the glue that binds people to their communities, and reflects the value of all relationships within a community.

Social capital is created when people interact with one another, for example by volunteering, helping each other, getting involved in community issues, working toward a common goal or sharing useful skills, contacts and resources.



With these examples in mind, it starts to become clear how something like a local dog park could strengthen and contribute to the social fabric of a community by providing opportunities to build relationships, share useful information, trade dog watching (or walking) favours, volunteer, become more civically engaged and interact with local officials.

Health benefits associated with high levels of social capital include lower mortality rates, higher self-rated health, better general health and a decrease in common mental disorders³¹. Research conducted in

other areas has also identified associations between strong social capital and decreases in violent crime, positive child development and quality community governance³¹.

These social benefits of animals to the community extend beyond pet owners. Research in this area has found that even those without pets in their homes believe that having pets in the community creates opportunities to socialise with neighbours³², and that having owned a pet in the past can continue to provide long-term positive effects on social connectedness and sociability³³.

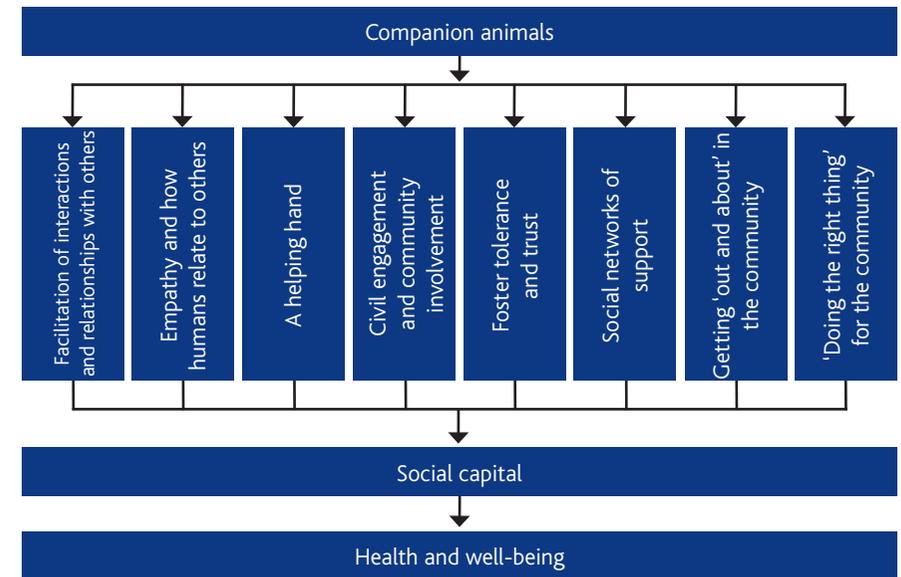


Figure 1. Conceptual model of the way in which companion animals foster social capital (Wood, L.J., Figure 2.2 (p. 28) from "Community Benefits of Human-Animal Interactions...the Ripple Effect," in McCardle, P. et al., *Animals in Our Lives: Human-Animal Interaction in Family, Community, and Therapeutic Settings*. Copyright © 2011 Paul H. Brookes Publishing Co., Inc. Baltimore. www.brookespublishing.com. Reprinted by permission).



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Animals in therapeutic contexts

Animal-assisted intervention

The modern practice of including animals in programmes designed to aid in the treatment of physical and psychological disorders finds its roots in the writings of child psychotherapist, Boris Levinson, in the late 1960s and 1970s; 'The pet, in a sense, becomes the mirror in which the child sees him(her)self wanted and loved not for what he (or she) should be or might have been but for what he (or she) is.'

Animal-assisted intervention

While the term animal-assisted therapy (AAT) is often used to describe any situation where an animal is brought into a therapeutic setting, the technical definition of AAT is much more limited and specific.

When correctly applied, animal-assisted therapy refers to a programme where an animal is intentionally included as part of a goal-directed, personalised treatment plan that aims to provide measurable, documented improvements in human physical, social, emotional or cognitive functioning. Programmes that are more informal and primarily concerned with improving quality of life are categorised as animal-assisted activities (AAA). Pet visitation programmes – now common in hospitals, nursing homes, and similar settings – would fit within this latter category. The term animal-assisted intervention (AAI) is a more general term used to refer to both AAT and AAA programmes.

Today, animal-assisted interventions are practised with people at all stages of life, and can be found in every conceivable medical or mental health care setting, as well as in schools, universities, workplaces, community centres, juvenile detention facilities and prisons.

The rationale for the creation of animal-assisted interventions, or the introduction of animals into these contexts, tends to include some of the potential benefits that have already been presented (e.g. reducing stress or distress, providing social support, increasing motivation, creating a sense of community and facilitating social interactions), but may also have the goal of assisting with behavioural change, or facilitating the acquisition of new skills.

To promote behavioural change and facilitate the development of enhanced social skills, a variety of AAls make use of the behavioural lessons contained in positive/rewards-based animal training methods. Participants in these programmes learn how to train animals (typically dogs) by rewarding correct behaviours (those the participant/trainer is trying to elicit) and ignoring behaviours that are incorrect or undesirable.

Skilled facilitators within these programmes are able to draw parallels between the effects of uncontrolled behaviour from the animals and the social consequences of unchecked behaviour among people, while the animals provide immediate and unambiguous responses to both enjoyable and unpleasant ways of interacting.

Participation in these programmes has been associated with a reduction in negative behaviour (e.g. aggression/non-compliance) and improvements in social functioning (e.g. use of appropriate voice tone, improved relationships with peers).

The benefits conferred by these interventions are presumed to be derived, in part, from their ability to demonstrate appropriate behaviour and behavioural consequences, and by providing opportunities for participants to learn and practise alternative behaviours without the fear of criticism or rejection that can occur in human-human interactions. Programmes such as these have particular relevance for, and have been implemented in, special education, residential treatment and correctional facilities.

Although this booklet focuses primarily on cats and dogs, interventions that include horses are also quite common. These programmes are often referred to as equine-assisted therapy, therapeutic riding or hippotherapy. Hippotherapy is distinct from other kinds of equine programmes in that it is specifically employed by physical, occupational and speech therapists who use the motion of the horse to help patients make improvements in their motor skills, neurological functioning and ability to process sensory input.

Other equine-assisted interventions have more wide ranging applications, and are designed to assist people with cognitive, physical and emotional impairments. Therapeutic riding programmes typically involve participants learning specific riding or horse-care skills as a means to enhance areas such as self-esteem, responsibility, leadership and communication.





Assistance animals

Assistance animals serve to aid in the physical and, increasingly, psychological functioning of their handlers. Assistance, Guide, Signal, and Service Animals are typically dogs that are individually trained to provide assistance to a person with a disability. The role of these animals is to perform some of the functions and tasks that the individual cannot perform as a result of their disability.

Although the companionship of an assistance animal may provide its handler with some social or psychological benefits, the primary role of an assistance animal is to deliver functional assistance, not treatment. In many countries, assistance animals are defined and protected by laws that enable handlers to take them into places of business where pets are ordinarily prohibited. These protections do not typically apply to therapy animals.

The modern practice of employing assistance animals is thought to have originated in Germany in 1916, when a training school was established to provide dogs that could guide Germany's blind World War I veterans.

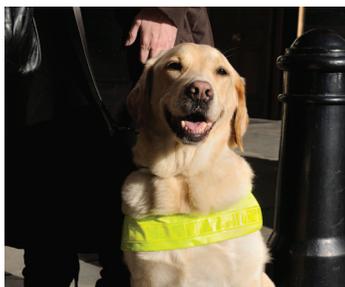
Although probably the most recognised role for assistance animals is as guide dogs for those with impaired sight, today, dogs and other animals (e.g. miniature horses) help people with a wide variety of conditions and disabilities to lead fuller, more independent lives.

It has recently been discovered that some dogs are able to predict the occurrence of seizures, or identify drops in blood sugar for people with diabetes, and can be trained to alert their handlers before these situations become dangerous. Ongoing research shows promise in the ability of some dogs to detect certain cancers such as melanomas or bladder cancers.

Although assistance animals are not considered pets, extremely close bonds can be formed between these animals and those they assist. Research investigating the psychosocial benefits of assistance dogs has reported that these relationships can enhance self-esteem and psychological well-being, along with providing opportunities for social interaction and increased community integration^{34,35}.

Animal welfare considerations

Ideally the assistance partnership should be a mutually beneficial interaction. In order to ensure the welfare of assistance animals it is essential that their health and behavioural needs are met.



Emerging trends with special populations

Social circumstances and advances in science and medicine have heightened public understanding and awareness of disorders such as autism spectrum disorders (ASD) in children and post-traumatic stress disorder (PTSD) in war veterans.

The prevalence of these disorders, combined with their ability to significantly impair functioning, and a shortage of effective, scientifically-validated treatments has resulted in an increasing role for therapy and assistance animals to support people with these conditions.

Autism-spectrum disorders (ASD)

For children with autism, animal and equine-assisted interventions have been reported to facilitate improvements in critical areas such as social functioning, focus and attention, prosocial behaviours, as well as decreases in self-absorption and stereotypic behaviours³⁶.

Programmes that can assist children with ASD in mainstream classrooms are urgently needed, and researchers in Australia are currently testing an innovative programme that teaches children with ASD to care for and interact with guinea pigs as a bridge to developing better skills to interact with their classroom peers³⁶.





Pets in the classroom

Enhanced learning for children

Post-traumatic stress disorder and returning war veterans

Veterans returning from war may have difficulty reintegrating into civilian life and are at risk for developing post-traumatic stress disorder (PTSD), an anxiety disorder that can occur after exposure to a life-threatening event. PTSD symptoms can include anger, nightmares or insomnia, hyper-vigilance, flashbacks or feelings of reliving the traumatic event, and emotional numbing and social withdrawal.

These symptoms have the capacity to severely limit the veteran's ability to function and can put tremendous strain on families. Service dogs are now being trained to help veterans cope with a wide

range of PTSD symptoms. Service dogs can help prevent social isolation and increase feelings of safety by accompanying the veteran in public places, and by alerting to the approach of another person, or maintaining a boundary of personal space by positioning themselves between the veteran and approaching strangers. In addition, new therapeutic programmes are emerging that pair veterans with shelter dogs to work on basic obedience training and increase the dog's adoptability, or to train the dogs to become service animals for other returning veterans. Working with the dogs provides the veterans with structure and a renewed sense of purpose, while also helping to ensure that shelter dogs find new homes.



In recent years, schools have begun to employ animal-assisted educational programmes that aim to improve students' motor skills, communication and reading abilities, while also harnessing the calming or motivating effects that animals can provide.

Studies on the educational benefits of including animals in classrooms have found that pre-school children are more likely to adhere to instructions and perform certain motor-skills tasks (e.g. completion of an obstacle course) faster, but without sacrificing accuracy, in the presence of a dog^{37,38}. The presence of a dog has also been associated with enhanced performance on cognitive tasks (e.g. matching one picture with a related picture)³⁹. Improvements in communication among students and between teacher and students, decreased behavioural extremes (both aggression and withdrawal) and increased attention directed toward the teacher, have also been reported when dogs are present in the classroom⁴⁰.

Reading programmes

A variety of programmes have also been introduced that aim to improve students' reading skills by giving them opportunities to read aloud to dogs. The rationale for these programmes is that the presence of a dog may decrease a child's anxiety about reading and reading aloud, while the dog serves as a non-judgmental, non-critical audience to the child's reading practice. Some in education and child development have voiced scepticism about the capacity of these interventions to significantly improve reading levels (in part due to the lack of instruction or feedback provided to the children). A stronger evidence base is needed to confirm encouraging early reports.

Special education

Special education, in particular, has looked to the calming effects of animals to decrease disruptive behaviours in the classroom. Although evidence for the effectiveness of these programmes is limited, there does appear to be general agreement among them that the presence of animals can reduce emotional outbursts, aggression and other undesirable behaviour^{41,42}. This is supported by similar findings obtained in other settings⁴⁰.

Although animals can be found in classrooms around the world as supportive educational partners, it is unclear why the mere presence of a calm, friendly animal is associated with such a wide range of educational, emotional and behavioural benefits.

Researchers in this area have speculated that, in addition to reducing stress and anxiety, animals may help children to focus attention, or may provide some form of motivation to learn or succeed at a task.

In light of the prevalence of attention deficit hyperactivity disorder (ADHD) in some countries, findings related to improvements in attention and focus may have particular significance for the development of future educational programmes for children with this condition.



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Living healthier, happier lives together

Maintaining healthy lifestyles

The many health benefits of regular physical activity are well documented, and include lower rates of cardiovascular disease, Type 2 diabetes, depression and certain types of cancer. Recent studies have reported that dog owners who walk their pet are more likely to meet national guidelines for physical activity. From a public health perspective, promoting dog walking as a means of reaching physical activity guidelines is appealing due to the high proportion of people who share their lives with dogs, the ease and low cost of participating in dog walking and the type of moderate-intensity physical activity involved^{43,44}.

Even modest increases in dog walking (90 minutes per week), may produce substantial reductions in new cases of many conditions linked to sedentary lifestyles (e.g. coronary artery disease, diabetes, colon cancer) and may result in significant healthcare savings⁴⁵.

Studies have reported lower rates of obesity among those who walk with their dogs⁴⁶. For people of all ages, having a dog in their life can be a great motivator to get active together.



Building long and happy relationships

A successful partnership

The foundations of a long and happy relationship with a pet are created when care is taken to choose a suitable pet and meet all its welfare requirements by ensuring that it is well socialised and trained, and well fed and cared for in health and illness.

Pet selection

Selecting the right pet for the owner's living situation, environment, future plans, activity level, lifestyle, budget and available time is critically important. For example, if an owner travels a great deal, or has limited time, a pet that needs lots of care and attention may not be the best option. Becoming educated about the needs, life spans and temperaments of various species and breeds will help people make an informed choice. It is important to appreciate the nutritional, behavioural and health needs of any pet species to ensure that their welfare is not compromised.

Selection does not end with deciding on the type or breed of pet wanted, or learning about its needs. It is also important to spend time with a potential pet before deciding to welcome it into the family. Just like people, animals are individuals with unique personalities and temperaments. Even among animals of the same breed (or even those from the same litter) there are huge individual variations. Simply choosing a breed with an affable reputation (e.g. a golden retriever) does not guarantee a good match for a particular family or living situation.



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Socialisation

Providing adequate socialisation, particularly to puppies and kittens, is critical to ensuring a pet's long-term well-being. Pets who are inadequately socialised cannot relax and enjoy life, and are frequently stressed by even minor events. Poorly socialised dogs and cats are less likely to make rewarding pets, and are at increased risk for euthanasia due to behavioural problems.

Training

In addition to socialisation, training is particularly important for dogs. If a dog is expected to behave in a certain way, such as relieving themselves outside, then owners must teach them how to successfully meet those expectations. Obedience classes and puppy classes are widely available, as are instructional books and other resources. In addition to teaching basic obedience, group classes offer excellent opportunities for puppy socialisation. Training is a great means of building the bond between owners and their pets.

Nutrition

Providing a healthy, nutritious, high-quality diet is important to ensuring a long and healthy life for pets. Diets that are suitable for humans rarely provide the nutritional balance that dogs and cats require, so it is best to avoid giving them 'people food'.

Some common ingredients in human food can be toxic to cats and dogs, including chocolate, grapes, raisins and onions. One way to ensure that all essential nutrient requirements are met is to feed pets a complete and balanced manufactured diet. In most cases, these diets are based on decades of scientific research and expertise, and are carefully designed to provide the right amount of nutrients according to a pet's lifestage or lifestyle.

Veterinary care

Just like people, pets need regular medical and dental care. Vaccinations are especially important for puppies and kittens, but are needed at regular intervals for pets of all ages.

Regular check-ups and preventative care for problems like heartworms and fleas also help to ensure a pet's health and well-being.

Periodontal disease is one of the most common diseases in dogs, and can result in pain, tooth loss and chronic infections. Dental care not only helps to prevent periodontal disease, it may also be beneficial to a pet's general health.





Exercise and play

Providing opportunities for pets to exercise is essential to keeping pets healthy.

Having a happy, healthy relationship also means taking time to just play and have fun together. Having fun together helps to build the bond between a person and their pet, enriching their relationship.

Exercising dogs

Ideally, dogs should be exercised at least twice a day, and the amount of exercise depends on the dog's breed, size, age and health status, as well as external factors such as the temperature and weather conditions. On hot days, it is a good idea to provide exercise during the early-morning and evening hours when it is cooler. To keep things interesting for both the dog and owner, regular walks can be combined with activities like running, swimming, hiking and 'play dates' with other dogs. Simply letting a dog outside may not provide suitable exercise as many dogs will not exercise at sufficient intensity unless encouraged by an owner.

Most dog owners are familiar with common games like fetch, but canine sports, such as agility, flyball and canine freestyle, are growing in popularity.

Such activities not only provide dogs with mental stimulation and physical activity, but offer opportunities for owners to increase their own physical activity as well.

Suggestions for exercising dogs

- Walking or running with their owner
- Swimming, where it is safe to do so, or dog hydrotherapy pools
- Interactive play with other dogs of suitable size and temperament
- Throwing toys designed for dogs to fetch (the use of sticks or stones is not recommended as they may result in injury or damage to dogs' teeth)
- Canine sports such as agility and obedience training can provide a useful and social method of increasing physical activity for both owner and dog.



Exercising cats

Exercising cats can be achieved by stimulating their hunting instinct. Often cats are reluctant to exercise themselves. Cats enjoy opportunities for play and, for indoor cats, play may be their primary source of exercise.

Many commercially-available cat toys enable active participation with owners, but inexpensive everyday items such as paper bags and cardboard boxes are also perennial cat favourites.

Suggestions for exercising cats

- The use of toys is often very successful, particularly the fishing rod type toys as well as small toys that can be thrown for cats to chase, such as ping-pong balls

- Cats love to hide and then pounce so poking toys through the holes of a box is a good way to get cats interested in playing
- Cats rapidly become bored with familiar toys, so it is important to provide as much variety as possible
- Some cats love food puzzles where they have to interact with a ball or other device so that it releases pieces of dry food
- Cats are physiologically suited to short, rapid bursts of activity, rather than sustained exercise. Therefore, it is usually better to use a number of short play sessions rather than a single prolonged period
- Structures such as climbing and scratching posts can also be beneficial in stimulating exercise.





Staying safe with pets

Some practical advice

Interacting with pets and other animals can be a source of joy, and can confer health and psychological advantages to both children and adults. It is important, however, to consider these benefits alongside the challenges of pet ownership. Some of the most notable risks of pet ownership include animal bites and zoonotic diseases. Fortunately, applying some simple techniques when interacting with pets will significantly reduce these risks.

Animal-related Injuries

Animal bites and pet-related falls can cause injury, and while most are minor and do not require medical attention, children and the elderly are more vulnerable to serious injury from bites and falls, respectively. Part of staying safe with pets means understanding that each animal is an individual – with different likes, dislikes and fears. An owner should never assume a type of interaction enjoyed or tolerated by their pet will be equally acceptable to another person's pet.

Many people are unaware of or misinterpret animal behaviour. Providing education to parents and pet owners about the causes of animal bites has the potential to substantially decrease animal-related injuries.

Some tips for adults

- Before getting a pet, new owners should consult with a professional (e.g. veterinarian or animal behaviourist) to help determine the best choice for their lifestyle and environment
- Children and babies should never be left unsupervised with a dog, and interactions between children and dogs should be closely monitored. Any dog is capable of biting. Even those who show no signs of aggression may bite if startled, or accidentally hurt (e.g. tail stepped on)
- Ageing pets may be in pain or have diminished senses which may make them less tolerant of interactions and more likely to be startled or feel threatened
- Pets may give little indication that they are ill or in pain, and an underlying medical condition, such as dental pain, can cause changes in a pet's behaviour. Pets who show a sudden change in behaviour should be examined by a veterinarian
- Spaying and neutering may have little effect on dog aggression, although it may still be worth doing for other reasons

- Children are often bitten in relation to guarding behaviour, e.g. a dog being protective of food, toys, territory, puppies, or other items of importance to the dog. Children and dogs should be kept separate when there is food present (even 'people food'), and children should be taught not to approach unfamiliar dogs or female dogs with puppies
- Many people are unaware of, or misinterpret, animal behaviour and body language. A wagging tail, or an exposed belly, does not necessarily indicate friendliness or a desire for interaction. Learning about common canine and feline body postures and signals can be highly beneficial to the safety of both people and pets.

Some tips for children

- When interacting with pets; be gentle, speak softly, respect the pet's need to be alone, and to sleep and eat without interruption
- Always ask permission from a parent and from the pet owner before touching any pet
- Like people, animals feel pain and do not like to have their ears or hair pulled or limbs prodded
- Do not chase or corner a pet, let them come to you
- Understand and heed the warning signs animals make (hiss, growl, retreating, snarling) and know when to leave them alone
- If a pet looks fearful or is backing away, so should you. Avoid direct eye contact as this can be threatening to some dogs
- Never tease or pull a toy or food away from a dog
- Never slap, kick, shout at or act threateningly towards any animal
- All animals, like humans, can bite and scratch when provoked
- Always wash your hands after interacting with a pet.





Zoonoses

Zoonoses are diseases that can be transmitted from animals to humans. Although dogs and cats can carry a variety of diseases and parasites which may be passed on to people, the risk of getting sick from touching or keeping pets is small.

Certain populations, such as pregnant women, children under five years of age, or people who have compromised immune systems such as those undergoing cancer treatment, organ transplant recipients, or people with HIV/AIDS, may be at a slightly greater risk. To minimise the likelihood of contracting zoonotic infections people are advised to always wash their hands after contact with an animal and to avoid rough play with pets in order to prevent bites or scratches that could become infected.



Allergies

A small proportion of people may develop allergies to pets which may present as allergic rhinitis/conjunctivitis ('hay fever'), asthma, atopic eczema and urticaria ('hives').

Being allergic to dogs and cats does not automatically mean a life without pets. Allergists and immunologists may be able to provide medical solutions, and there are also many lifestyle changes that can help to minimise allergy symptoms, for example:

- Keeping pets out of bedrooms and off upholstered furniture
- Removal of rugs and carpeting, which can trap allergens
- Some studies have indicated that bathing a pet weekly can significantly reduce the presence of allergens
- Regular brushing can also help remove allergens from pets, but this should be done outside and by someone who is not allergic.

The end of the relationship

Coping with the loss of a pet

Losing a pet is often one of the most difficult aspects of sharing life with them. Pets may succumb to illness, trauma or old age. Owners may suffer loss when their pet must be relinquished or rehomed (e.g. when an elderly person must enter an assisted-living facility that prohibits pets), or in cases where the fate of the pet is unknown (e.g. when a pet runs away or is stolen). Just as every person and pet are different, so are each individual's responses to the loss of an animal companion. It is not just people who experience loss; other pets in the family may also display grief-like symptoms (loss of appetite, listlessness, vocalisations). Understanding the potential impact of pet loss is an important first step in supporting someone who is grieving.

Many people consider their pets to be a member of the family, and yet, there are no culturally defined and accepted rituals for mourning the loss of a pet.

Fortunately, there is increasing recognition of the importance of pets in people's lives, and this has resulted in a greater availability of resources for those who are coping with the loss of a pet. A quick internet search will produce links to organisations that specialise in providing pet loss information and resources for coping, pet loss hotlines and products to honour and memorialise pets who are no longer here.

Locally, it is not uncommon to find support groups and therapists who have a focus on pet bereavement, and veterinarians may be able to direct people to these and other resources.

Those who have lost a pet frequently express the need to talk about their experience and to have their feelings recognised and accepted by others. The wider availability of resources has made it easier for those coping with pet loss to find understanding and support.





Future focus

A better world for pets and their people

Throughout history, the relationship between humans and pets has been one of the world's most unique and enduring bonds. This special relationship benefits both humans and pets, and goes beyond mere companionship. People see their pets as important members of their families - they are friends, playmates and protectors - providing love, security and joy to their humans. In turn, it is our responsibility to help make a better world for pets by taking care of them and providing them with loving, safe and happy homes, good healthcare and nutrition, and proper training and socialisation.

Not only do pets bring joy to the people around them – interacting with pets delivers real, tangible benefits for individuals and communities. The early work on HAI has provided intriguing evidence that pets may, for example, promote better physical and psychological health in their owners, support socio-emotional development of children, enhance learning in the classroom, facilitate more active, healthy lifestyles, help maintain or improve functionality in elderly adults and provide emotional support in a whole range of contexts when life gets challenging.

Human-Animal Interaction research is enjoying a period of unparalleled expansion, and the quality and complexity of studies are increasing simultaneously within the field. These conditions are due, in part, to new types of researchers joining the study of HAI (e.g. neuroscientists) and also to the formation of unprecedented collaborations. For example, the public-private partnership forged between the WALTHAM® Centre for Pet Nutrition and the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, which has supported the field through a variety of activities and resources including a multi-million dollar grant programme available for HAI research.

The HAI field has been newly invigorated by increased availability of research funds; technological advances in neuroscience; and an infusion of new scholars, ideas, and methods. As the field enters this new phase in its development, it will continue to build on earlier work to create a stronger evidence base for the reported beneficial effects of pet ownership. As part of this, the field will continue to expand its focus beyond developed, Western countries, and explore the roles that culture, ethnicity and geography play in people's perceptions of animals and the practice of pet ownership. A stronger foundation is needed to convince medical and other authorities of the physical and psychological benefits that can result when pets and people share their lives or interact in a therapeutic context, and to provide assurance and protection to consumers of therapeutic services.

Authorities need to see this evidence to be convinced that pets play a role in our lives that is beneficial to individuals but also for growing healthier communities and cutting health costs at a national level. The bond between humans and their pets is special and, as a leader in the field of HAI research, WALTHAM® are dedicated to celebrating it through programmes and partnerships that highlight the benefits of having a pet.



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