My Talk with the Speechless

AUTHORS DETAIL

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INTRODUCTION

A common word used to describe the types of social attachments that frequently develop between humans and their pets is "human-animal bond". Many animals, for instance, lab rodents, working horses, dogs, and dairy goats are not usually recognized as pets because they are raised for a purpose i.e., the goats are used for meat and milk production. It is not comfortable for humans both morally and psychologically to avoid the beneficial aspect of these animals (Davis and Balfour 1992; Serpell 1996).

Human-pet bonds are quite common and favoured. Various estimates show that Americans own about 80 million cats and 75 million dogs as pets, in addition to millions of birds, reptiles, amphibians, and fish. According to a 2012 survey, approximately 63 percent of US families have at least one pet and 45 percent have more than one pets. The figures in the European Union are likewise showing about 60 million dogs and 80 million cats. According to the 2014 Euromonitor International, the number of pets in developing countries such as Brazil, Thailand, and Turkey are rapidly increasing. Although pet ownership is probably more popular today than it has ever been, this fascinating human behaviour is neither modern nor limited to more affluent, "westernized" societies (FEDIAF 2014).

Historical Perspective

In the excavation at a pre-Natufian cemetery in Jordan, almost 14 to 17 thousand years old pet fox were found buried with a human body. This archaeological proof provides information on emotional relations between humans and animals from a long time ago (Maher et al. 2011). This archaeological evidence is also found around the world, for example, a 12–14-thousand-year-old human and dog remains were found in Israel and Germany, and a fossil of a 9,500-year-old cat and human was discovered in the Mediterranean island of Cyprus (Davis and Valla 1978; Vigne et al. 2004; Morey 2006).

Cultural Perspective

Pet keeping among hunters and horticulturists is a routine matter rather than an exception, as per many explorers and anthropologists. Hunters typically capture these pets as young animals, which are then cared for by their entire families. Animals, especially companion ones, are the source of emotional support for their humans. The emotionally attached person to his pet gives all the facilities to the pet. The owner also gives a proper burial when the pets die. And this time is also very tough for the owner to get over it. There are also some social taboos against some animals kept as a pet. There are also some strict rules against the unethical killing of animals for the social well-being of man. The eating of animals that are selected as a pet is also prohibited even if their meat is normally consumed (Simoons and Baldwin 1982; Serpell 1989; Erikson 2000).

Animal domestication began because of the widespread practice of keeping pets in pre-agrarian communities, according to several writers (Galton 1883; Sauer 1952). Most forms of physical intimacy between humans and animals appear to have been morally dubious throughout the medieval and early modern periods, and the habit of keeping pets only as companions was also often prohibited (Salisbury 1994; Serpell 2005). In some situations, engaging in human-animal relationships could lead to charges of witchcraft (Serpell 2002).

Pet ownership was not a piece of cake. Before the modern period, only the elite and upper classes could afford the ownership, but after the modern period, the urban middle class of Western society have their pets which resulted in the spread of pets into various sectors of society. This shift in

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thoughts and conduct toward animals can be partially linked to the constant influx of Europeans and Americans into urban areas from remote regions at this time. There is no longer a need for value systems that categorize humans and nonhumans into distinct moral spheres because of the urban migration that tends to exclude larger segments of the population from actual participation in the consumption of animals (Serpell and Paul 1994).

Pets are also used for many therapeutic purposes as they are a tool to test the efficiency of a drug. The York Retreat was the first metal institute in England that use animals as a tool in the eighteenth century. In the Victorian era, pets became a more pronounced subject to be used in British mental institutions. John Locke (1632-1704) was an English philosopher who use animals to develop a sense of empathy and responsibility in children by allotting a pet to everyone (Serpell 2011).

Moral Code of the Animal-Human Bond

The evolutionary history shows that the use of animals as pets and companion animals is not so common (Serpell and Paul 2011). A recent study shows the estimate of expenses to have a pet dog in America is almost \$17,500 to \$93,500 which costs daycare, medicine, and dog walkers. And to have a cat as a companion animal, the owner has to pay almost \$17,000 for its care throughout its life. On average Americans spend \$50 billion a year on the health and well-being of their dogs, yet it can be challenging to find or quantify any clear benefits (Forbes Magazine 2014).

Human-pet ties seem to be common, regardless of the fact that whether our attention is on hunters or on homeless persons leading hard lives on the streets (Rew 2000; Taylor et al. 2004). Darwin's theory explains natural selection based on the maintenance and spread of the behaviour of humans. This theory focuses on the survival of the fittest, hence the lack of utility which explains pet ownership is a big challenge to biologists and psychologists (Hamilton 1966; Williams 1966).

'Bond' or 'Bondage'

One of the major challenges faced by the concept of the animal-human bond is the living cost of the pet in the owner's pocket with no vivid benefits and some potential harm to the owner or his family members. This theory states that pets like dogs, cats, and many other companion animals are like social parasites which take too many advantages from the owner in the form of shelter, food, and medication (Fig. 1), but don't comply in returning the favour to that extent. Also cited as proof of selection for phenotypic qualities that improve these animals' capacity to elicit human parental responses are the tiny size, neotenic face features, and infantilized behaviour of many canine breeds (Archer 1997).

The social parasitism hypothesis, though challenging to disprove, assumes that pet owners must either be at a competitive disadvantage with non-owners or that the fitness costs of pet ownership are insignificant in comparison to the risks of being overly selective when it comes to potential parental care recipients. The relationship between two individuals in which both get the benefits is called mutualistic interaction between them i.e., the coral reef fish and tiny cleaner wrasse. The *Labroides dimidiatus*, a wrasse, has an association with larger fish where the wrasse gets food, and in return, they remove the dead tissue and the ectoparasites from the mouth and gills of the larger fishes. During this period, wrasse remains unharmed and performs their work without any kind of hindrance (Herre et al. 1999; Johnstone and Bshary 2002).



Fig. 1: Pet owner caring attitude

Merits of the Animal-Human Bond

A significant surge in scientific interest in the potential health advantages of the human-animal link occurred in the late 1970s, thanks to the findings of a Ph.D. dissertation from the University of Maryland (Friedmann et al. 1980). The risks of cardiovascular disease are much lower among pet owners compared to non-owners, according to other research that looked at risk variables for the disease in sizable population samples, such as blood triglycerides and cholesterol (Allen et al. 1991; Anderson et al. 1996; Friedmann et al. 2000; Wells 2009).

The purchase of a new pet has been linked to increases in owners' mental and physical health as well as to sustained decreases in their propensity to overreact in stressful situations and stimuli (Allen et al. 2001; Serpell 1991). Additionally, pet owners seem to be more robust in the face of difficult life circumstances, which leads to fewer health issues and fewer trips to the clinic for treatment (Siegel 1990). Significantly, pet owners who are very devoted to their animals tend to gain more from pet ownership than those who are less attached, and dog owners generally fare better than cat owners, possibly because the bond between dogs and their owners is, on an average, greater (Fig. 2) (Friedmann and Thomas 1995; Ory and Goldberg 1983).



Fig. 2: Pet and owner loving bond.

In comparison to non-dog owners, dog owners have been found to engage in more walking and general physical activity and some studies have indicated a strong link between dog walking and lower body weight as well as lowered risks of diabetes, hypertension, hypercholesterolemia and depression (Cutt et al. 2007; Coleman et al. 2008; Hoerster et al. 2011; Lentino et al. 2012).

Companion animals are also a source of healthy interaction and help in improving social behaviour within a society. It has been examined through many research studies that people having pets are socially more popular in a community even old persons and individuals with any kind of physical disability (Mader et al. 1988; McNicholas and Collis 2000; Wells 2004; Guéguen and Ciccotti 2008).

Pet ownership is favourably correlated with feelings of neighbourhood friendliness and social interaction between neighbours, according to community-based surveys. After correcting for demographic variables, pet owners also frequently do better than non-owners on tests of "social capital" and civic participation (Wood et al. 2005).

The Therapeutic Perspective of 'The Bond'

The great advancement in the work related to the use of a pet dog as a therapeutic agent was done by an American child psychotherapist named Boris Levinson in the 1960s and 1970s. He used to bring his dog named Jingles during the session with patients as they feel more comfortable in the presence of his dog. He says that pets help to deal with many psychological issues and physical disabilities of children. He used to say pets as "co-therapists" while dealing with patients (Levinson 1969).

The first researchers to empirically examine Levinson's theories were a husband and wife team of psychiatrists at Ohio State University named Samuel and Elizabeth Corson. Within the psychiatric hospital where they worked, in the 1970s, they established what they dubbed a "pet-facilitated psychotherapy" (PFP) program and chose 47 withdrawn and uncommunicative patients, the majority of whom had not responded well to more traditional treatment approaches. The next step was to involve every patient in the daily upkeep and exercise of a colony of laboratory dogs that resided close to the hospital. Even though they only published information about five subjects—all of whom had significantly improved—the Corsons reported "some improvement" in all of the patients at the end of the trial (Corson and Corson 1980).

In the late 1970s and early 1980s, a surge of research in Europe and North America was spurred by the Corson study with the aim of identifying and evaluating the advantages of AAIs (Animal-assisted interventions) in a variety of patient populations and therapeutic contexts. Unfortunately, a lot of these early studies had a number of design issues. Only six controlled experimental trials of animals' therapeutic value were found in an extensive assessment of the literature on

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AAIs conducted in 1984; all of these studies targeted adult or elderly individuals. The studies indicated either "no impact" or "very small treatment benefits," according to the authors' analysis (Beck and Katcher 1984).

Only nine research (six comprising control groups and three pre-/post-treatment designs) that supplied sufficient statistical data to allow the computation of effect sizes were found in a meta-analysis of 112 pertinent studies conducted 19 years later, in 2003. Following the initial 1984 evaluation, all nine studies were released, and they were all done on adult and/or senior populations. The meta-analysis discovered an average effect size of 0.76, which is widely regarded as large, in contrast to the earlier evaluation that these therapies had only marginal therapeutic efficacy (LaJoie 2003).

Investigations into the potential processes underpinning the positive benefits of AAIs are still ongoing, however, the social-bonding hormone oxytocin has been linked to the phenomenon. Our knowledge of these mechanisms, as well as the specific ways in which they affect various subject (patient) groups in various treatment contexts, will continue to be improved by future research (Kruger and Serpell 2006; Moberg et al. 2011).

Non-Human yet Humane companions

The idea that pets might act as forms of non-human social support is congruent with the apparent connections between pet ownership and human health (Collis and McNicholas 1998; Garrity and Stallones 1998; Ortega and Casal 2006). A theoretical concept known as social support measures how socially integrated people are and how closely they feel a responsibility and obligation to one another (Eriksen 1994; Schwarzer and Knoll 2007).

An increasing corpus of research has demonstrated a strong correlation between social support and improved human health and survival (House et al. 1988; Glaser and Newton 2001; Lim and Young 2006; Lunstad et al. 2010). For instance, it has been demonstrated that social support components can guard against depression, schizophrenia, and suicide as well as the cancers, rheumatoid arthritis, diabetes, nephritis, and pneumonia (Sherbourne et al. 1992; Esterling et al. 1994; Kikusui et al. 2006; Uchino 2006).

Once more, the neuropeptide hormones oxytocin and arginine-vasopressin, which are also essential in the regulation of attachment behaviour and social bonding in mammals, appear to be mediating some of these advantageous benefits of social support (Donaldson and Young 2008). Furthermore, the hypothalamic-pituitary-adrenal (HPA) axis, which controls the stress response, is downregulated by the release of oxytocin associated with enjoyable social interactions (Heinrichs et al. 2003).

The emotional attachments of humans and animals have also been described as this relationship results in a positive impact on society. Four major studies reveal that the hormonal status (oxytocin) of pet owners shows fluctuations when they are having quality time with their dogs (Odendaal and Meintjes 2003; Miller et al. 2009; Handlin et al. 2011; Handlin et al. 2012).

Another study found that owners of dogs who received more visual attention (gaze) from their dogs during an experimental trial had considerably higher levels of oxytocin metabolites in their urine. These owners also admitted to having greater bonds with their more attentive dogs when questioned (Nagasawa et al. 2009).

The study of human behaviour shows that the isolation of an individual has a negative impact on society. According to the natural selection theory, primates usually lived in groups and form a community where they support each other. An isolated person living in such a supportive community receives a welcome from the people whenever they decided to go out (Silk et al. 2009; Silk et al. 2010).

Ethical Perspective of the Animal-Human Bond

The extremely huge number of animals that now live alongside people can have a damaging effect on the ecosystem. There are many obvious instances, such as the depletion of wildlife resources for the exotic pet trade, the effect of stray cats on wild bird species, and the contamination of parks and natural places with animal excrement (Coppinger and Coppinger 2001; Rosen and Smith 2010; Loss et al. 2012; Bush et al. 2014). Even meeting the nutritional needs of dogs can have a huge negative impact on the environment. A medium-sized family dog consumes about 360 pounds of meat and 210 pounds of cereal per year, according to one calculation. However, another estimate contends that America's 75 million domestic dogs may consume as many calories as about 35 million people. This much food would take the equivalent of about 20,000 square kilometers of agriculture to produce (Vale and Vale 2009).

While it is undeniable that species like dogs and cats have increased in number because of living alongside people, many individual animals pay a high price in terms of deteriorated health and welfare. Each year, millions of pets are abandoned, given to shelters, or put to death too soon as a result of broken human-animal ties. Thousands more are abused, neglected, or mistreated by their owners for a variety of reasons, from ignorance to wilful cruelty (Clancy and Rowan 2003; Arluke 2006).

Due to inbreeding, line breeding, or selection for extremely high physical conformation requirements, several purebred dog breeds suffer from painful and crippling health issues (Asher et al. 2009; Summers et al. 2010). The demand for some pets is outpacing the supply, which has led to an increase in commercial pet "farming," while the trade in exotic pets kills and causes great suffering to wild animals during their capture, transport, and subsequent acquisition by owners who are unaware of proper husbandry and care (McClennan 2012). Even the strongest and most loving of human-animal relationships can result in needless suffering for animals, as when an overly attached owner insists on pointless veterinary procedures to prolong the life of a terminally sick pet at all costs (Beck and Katcher 1996). When comparing the perceived costs and benefits of our relationships with companion animals, all these negative features of the human-animal link create significant ethical issues (Beck and Katcher 1996).

Conclusion

Animal-Human bond has been maintained since the beginning of the dawn either through the food chain or by the touch of companion animals. Pet lovers across the world spend billions of dollars yearly on these creatures' called pets. All sorts of animals are kept as pets these days, no matter what species they belong to. In the modernized era, almost every household in western countries owns at least one pet dog or cat. Excavations at different regions across the globe provided us with evidence of people keeping pets centuries ago. The cultural perspective can be taken from the fact that it's prohibited to consume a pet even if it belongs to an edible meat-holding species. No matter how much the expense, pet lovers bear it happily and bring forth their love to their companion animals by providing them with the basic needs of life. There's a rise in businesses comprising pet toys, pet foods, and medicines used for their treatment as well. Companion animals bring joy to the colourless life of many people who suffer from social anxiety. Therapeutic experiments have shown the tremendous importance of keeping pets close to depressed patients as they love their owners and give them a reason to live life happily.

REFERENCES

- Allen KM et al., 1991. Presence of Human Friends and Pet Dogs as Moderators of Autonomic Responses to Stress in Women. Journal of Personality and Social Psychology 61: 582-589.
- Allen KM et al., 2001. Pet Ownership, but Not ACE Inhibitor Therapy, Blunts Home Blood Pressure Responses to Mental Stress. Hypertension 38: 815-820.
- Anderson WP et al., 1996. Pet Ownership and Risk Factors for Cardiovascular Disease. Medical Journal of Australia 157: 298-301.
- Archer J, 1997. Why Do People Love Their Pets? Evolution and Human Behaviour 18: 237-259.
- Arluke A, 2006. Just a Dog: Understanding Animal Cruelty and Ourselves, Temple University Press, Philadelphia, PA.
- Asher L et al., 2009. Inherited Defects in Pedigree Dogs. Part 1: Disorders Related to Breed Standards. Veterinary Journal 182: 402-411.
- Beck AM and Katcher AH, 1984. A New Look at Pet-Facilitated Therapy. Journal of the American Veterinary Medical Association 184: 414-421.
- Beck AM and Katcher AH, 1996. Between Pets and People: The Importance of Animal Companionship 1996: 195-208.
- Bush E et al., 2014. Global Trade in Exotic Pets 2006-2012. Conservation Biology 28: 663-676.

- Clancy EA and Rowan AN, 2003. Companion Animal Demographics in the United States: A Historical Perspective. In: Salem D, Rowan A, Editors. The State of the Animals 2003: Washington, DC, Humane Society Press; pp: 9-26.
- Coleman KJ et al., 2008. Physical Activity, Weight Status, and Neighborhood Characteristics of Dog Walkers. Preventive Medicine 47: 309-312.
- Collis GM and McNicholas J, 1998. A Theoretical Basis for Health Benefits of Pet Ownership,'. In: Wilson CC, Turner DC, Editors. Companion Animals in Human Health: Thousand Oaks, CA, Sage; pp: 105-122.
- Coppinger R and Coppinger L, 2001. Dogs: A startling new understanding of canine origin, behavior and evolution. Simon and Schuster; May 27, 2001.
- Corson SA and Corson EO, 1980. Pet animals as nonverbal communication mediators in psychotherapy in institutional settings. In: Ethology and nonverbal communication in mental health: an interdisciplinary biopsychosocial exploration; pp: 83-110. Corson SA, Corson EO, Editors.
- Cutt H et al., 2007. Dog Ownership, Health and Physical Activity: A Critical Review of the Literature. Health and Place 13: 261-272.
- Davis H and Balfour D, 1992. The Inevitable Bond: Examining Scientist-Animal Interactions, Cambridge University Press, Cambridge.
- Davis SJM and Valla F, 1978. Evidence for Domestication of the Dog 12,000 Years Ago in the Natufian of Israel. Nature 276: 608-610.
- Donaldson ZR and Young LJ, 2008. Oxytocin, Vasopressin, and the Neurogenetics of Sociality. Science 322: 900-904.
- Eriksen W, 1994. The Role of Social Support in the Pathogenesis of Coronary Heart Disease: A Literature Review. Family Practice 1: 201-209.
- Erikson P, 2000. The Social Significance of Pet-Keeping among Amazonian Indians. In: Companion Animals and Us: Exploring the Relationships between People and Pets: Cambridge University Press; pp: 7-27. Podberscek AL, Paul E, Serpell JA, Editors.
- Esterling BA et al., 1994. Chronic Stress, Social Support, and Persistent Alterations in the Natural Killer Cell Response to Cytokines in Older Adults. Health Psychology 13: 291-298.
- "Facts and Figures, 2012. FEDIAF (European Pet Food Federation), accessed June 19, 2014.
- Friedmann E and Thomas SA, 1995. Pet Ownership, Social Support, and One-Year Survival after Acute Myocardial Infarction in the Cardiac Arrhythmia Suppression Trial (CAST). American Journal of Cardiology 76: 1213-1217.
- Friedmann E et al., 1980. Animal Companions and One-Year Survival of Patients after Discharge from a Coronary Care Unit. Public Health Reports 95: 307-312.
- Friedmann E et al., 2000. "Companion Animals and Human Health: Physical and Cardiovascular Influences. In: Podberscek AL, Paul E, Serpell JA, Editors. Companion Animals and Us: Cambridge University Press; pp: 125-142.
- Galton F, 1883. Enquiry into Human Faculty and Its Development (London, Macmillan).
- Garrity T and Stallones L, 1998. Effects of Pet Contact on Human Well-Being: Review of Recent Research. In: Wilson CC, Turner DC, Editors. Companion Animals in Human Health: Thousand Oaks, CA, Sage; pp: 3-22.
- Glaser JK and Newton TL, 2001. Marriage and Health: His and Hers. Psychology Bulletin 127: 472-503.

- Grier KC, 2006. Pets in America: A History, University of North Carolina Press, Chapel Hill.
- Guéguen N and Ciccotti S, 2008. Domestic Dogs as Facilitators in Social Interaction: An Evaluation of Helping and Courtship Behaviours. Anthrozods 21: 339-349.
- Hamilton WD, 1966. The Genetical Evolution of Social Behaviour. Journal of Theoretical Biology 7: 1-32.
- Handlin L et al., 2011. Short-Term Interaction between Dogs and Their Owners: Effects on Oxytocin, Cortisol, Insulin and Heart Rate: An Exploratory Study. Anthrozods 24: 301-315.
- Handlin L et al., 2012. Associations between the Psychological Characteristics of the Human-Dog Relationship and Oxytocin and Cortisol Levels. Anthrozodés 25: 215-228.
- Heinrichs M et al., 2003. Social Support and Oxytocin Interact to Suppress Cortisol and Subjective Responses to Stress. Biological Psychiatry 54: 1389-1398.
- Herre EA et al., 1999. The Evolution of Mutualisms: Exploring the Paths between Conflict and Cooperation. Trends in Ecology and Evolution 14: 49-53.
- Hoerster KD et al., 2011. Dog Walking: Its Association with Physical Activity Guideline Adherence and Its Correlates. Preventive Medicine 52: 33-38.
- House JS et al., 1988. Social Relationships and Health. Science 241: 540-545.
- Johnstone RA and Bshary R, 2002. From Parasitism to Mutualism: Partner Control in Asymmetric Interactions. Ecology Letters 5(2002): 634-639.
- Kikusui T et al., 2006. Social Buffering: Relief from Stress and Anxiety. Philosophical Transactions of the Royal Society B 361: 2215-2228.
- Kruger KA and Serpell JA, 2006. Animal-Assisted Interventions in Mental Health. In: Fine AH, Editor. Animal-Assisted Therapy: Theoretical Foundations and Guidelines for Practice: Academic Press, New York; pp: 21-38.
- LaJoie KR, 2003. An Evaluation of the Effectiveness of Using Animals in Therapy. PhD Dissertation, Spalding University, Louisville.
- Lentino C et al., 2012. Dog Walking Is Associated with a Favorable Risk Profile Independent of a Moderate to High Volume of Physical Activity. Journal of Physical Activity and Health 9: 414-42.
- Levinson BM, 1969. Pet-Oriented Child Psychotherapy, Springfield press, Pennsylvania, USA.
- Lim MM and Young LJ, 2006. Neuropeptide Regulation of Affiliative Behavior and Social Bonding in Animals. Hormones and Behavior 50: 506-517.
- Loss S et al., 2012. The Impact of Free-Ranging Domestic Cats on Wildlife of the United States. Nature Communications 4: 1396.
- Lunstad JH et al., 2010. Social Relationships and Mortality Risk: A Meta-Analytic Review. PLoS One 7: e1000316.
- Mader B et al., 1989. Social Acknowledgements for Children with Disabilities: Effects of Service Dogs. Child Development 60: 1529-1534.
- Maher LA et al., 2011. A Unique Human-Fox Burial from a Pre-Natufian Cemetery in the Levant (Jordan). PLoS One 6 (2011): e15815.
- McClennan S, 2012. Keeping of Exotic Animals: Welfare Concerns. Brussels: Eurogroup for Animal Welfare.
- McNicholas J and Collis GM, 2000. Dogs as Catalysts for Social Interactions: Robustness of the Effect. British Journal of Psychology 91: 61-70.

- Miller SC et al., 2009. An Examination of Changes in Oxytocin Levels before and after Interactions with a Bonded Dog. Anthrozods 22: 31-42.
- Moberg KU, et al., 2011. Promises and Pitfalls of Hormone Research in Human-Animal Interaction. In: How Animals Affect Us: Examining the Influence of Human-Animal Interaction on Child Development and Human Health: American Psychological Association, Washington, DC; pp: 53-81. McCardle P, McCune S, Griffin J, Maholmes V, Editors.
- Morey DF, 2006. Burying Key Evidence: The Social Bond between Dogs and People. Journal of Archaeological Science 33: 158-175.
- Nagasawa M et al., 2009. Dog's Gaze at Its Owner Increases Owner's Urinary Oxytocin during Social Interaction. Hormones and Behavior 55: 434-441.
- Odendaal J and Meintjes R, 2003. Neurophysiological Correlates of Affiliative Behaviour between Humans and Dogs. Veterinary Journal 165: 296-301.
- Ortega JV and Casal GB, 2006. Psychophysiological Effects of Human-Animal Interaction: Theoretical Issues and Long-Term Interaction Effects. Journal of Nervous and Mental Disease 194: 52-57.
- Ory MM and Goldberg EL, 1983. Pet Possession and Life Satisfaction in Elderly Women. In: New Perspectives on Our Lives with Companion Animals: University of Pennsylvania Press, Philadelphia; pp: 303-317. Katcher AH, Beck AM, Editors.
- Rew L, 2000. Friends and Pets as Companions: Strategies for Coping with Loneliness among Homeless Youth. Journal of Child and Adolescent Psychiatric Nursing 13: 125-132.
- Ritvo H, 1986. "The Emergence of Modern Pet-Keeping. In: Rowan AN, Editor. Animals and People Sharing the World: University Press of New England, Hanover, NH.
- Rosen G and Smith K, 2010. Summarizing the Evidence on the International Trade in Illegal Wildlife. EcoHealth 7: 24-32.
- Salisbury, 1983. Beast Within; Keith Thomas, Man and the Natural World: Changing Attitudes in England, 1500-1800, Allen Lane, London.
- Salisbury JE, 1994. The Beast Within: Animals in the Middle Ages, London and New York, Routledge.
- Sauer C, 1952. Agricultural Origins and Dispersals, MIT Press, Cambridge.
- Schwarzer R and Knoll N, 2007. Functional Roles of Social Support within the Stress and Coping Process: A Theoretical and Empirical Overview. International Journal of Psychology 42: 243-252.
- Serpell JA, 1989. Pet Keeping and Animal Domestication: A Reappraisal. In: The Walking Larder: Patterns of Domestication, Pastoralism and Predation: Unwin Hyman, London; pp: 10-21. Clutton-Brock J, Editor.
- Serpell JA, 1991. Beneficial Effects of Pet Ownership on Some Aspects of Human Health and Behaviour. Journal of the Royal Society of Medicine 84: 717-720.
- Serpell JA, 1996. In the Company of Animals: A Study of Human Animal Relationships, Cambridge University Press, Cambridge.
- Serpell JA, 2002. "Guardian Spirits or Demonic Pets: The Concept of the Witch's Familiar in Early Modern England, 1530-1712. In: The Animal/Human Boundary: Rochester University Press, Rochester; pp: 157-190. Creager AN, Jordan WC, Editors.

- Serpell JA, 2005. "Animals and Religion: Towards a Unifying Theory," In: The Human-Animal Relationship: Royal Van Gorcum, Assen, Netherlands; pp: 9-22. de Jong F, van den Bos R, Editors.
- Serpell JA, 2011. "Historical and Cultural Perspectives on Human-Animal Interaction". In: Animal in Our Lives: Human-Animal Interaction in Family, Community and Therapeutic Settings: Brookes Publishing, Baltimore; pp: 11-22. McCardle P, McCune S, Griffin J, Esposito L, Freund L, Editors.
- Serpell JA and Paul E, 1994. "Pets and the Development of Positive Attitudes to Animals". In: Manning A and Serpell JA, Editors. Animals and Human Society: Changing Perspectives, Routledge, London; pp: 127-144.
- Serpell JA and Paul E, 2011. "Pets in the Family: An Evolutionary Perspective". In: Salmon C and Shackelford TK, Editors. Oxford Handbook of Evolutionary Family Psychology: Oxford University Press, Oxford, UK; pp: 297-309.
- Sherbourne CD et al., 1992. Social Support and Stressful Life Events: Age Differences in Their Effects on Health-related Quality of Life among the Chronically Ill. Quality of Life Research 1: 235-246.
- Siegel JM, 1990. Stressful Life Events and Use of Physician Services among the Elderly: The Moderating Role of Pet Ownership. Journal of Personality and Social Psychology 58: 1081-1086.
- Silk JB et al., 2009. The Benefits of Social Capital: Close Social Bonds among Female Baboons Enhance Offspring Survival. Proceedings of the Royal Society B 276: 3099-3104.
- Silk JB et al., 2010. Strong and Consistent Social Bonds Enhance the Longevity of Female Baboons. Current Biology 20: 1359-1361.

- Simoons FJ and Baldwin JA, 1982. Breast-Feeding of Animals by Women: Its Socio-Cultural Context and Geographic Occurrence. Anthropos 77: 421-448.
- Summers J et al., 2010. Inherited Defects in Pedigree Dogs. Part 2: Disorders That Are Not Related to Breed Standards. Veterinary Journal 183: 39-45.
- Surveys Yield Conflicting Trends in US Pet Ownership, VIN News Service, accessed September 14, 2014.
- Taylor H et al., 2004. Homelessness and Dog Ownership: An Investigation into Animal Empathy, Attachment, Crime, Drug Use, Health and Public Opinion. Anthrozods 17: 353-368.
- The True Costs of Owning a Pet. Forbes Magazine, accessed May, 2014.
- Uchino BN, 2006. Social Support and Health: A Review of Physiological Processes Potentially Underlying Links to Disease Outcome. Journal of Behavioral Medicine 29: 377-387.
- Vale B and Vale R, 2009. Time to Eat the Dog? The Real Guide to Sustainable Living, Thames and Hudson, London.
- Vigne JD et al., 2004. Early Taming of the Cat in Cyprus. Science 304: 259.
- Wells DL, 2004. The Facilitation of Social Interactions by Domestic Dogs. Anthrozods 17: 340-352.
- Wells DL, 2009. The Effects of Animals on Human Health and Well-Being. Journal of Social Issues 65: 523-543.
- Williams GC, 1966. Adaptation and Natural Selection: A Critique of Current Evolutionary Thought, Princeton University Press, Princeton.
- Wood L et al., 2005. The Pet Connection: Pets as a Conduit for Social Capital. Social Science and Medicine 61: 1159-1173.