

Gail F. Melson, Ph.D

Purdue University

Introduction

The study of children's development traditionally has focused on children's relationships with other humans. However, in the last fifty years, there has been increased recognition that children live in a world of many different species and natural environments. Across cultures, pet ownership is common in households with children. In the United States, households with children under 18 years of age are more likely than any other household type to also contain resident animals. As a result, a majority of U. S. children is estimated to grow up with a household animal. Moreover, from wild bird feeding to walks in a park to visits to the zoo, even urban children have daily exposure to many species of wild animals. In addition, animals play important symbolic roles for children. Sigmund Freud, Bruno Bettelheim, and Karl Menninger were among the many scholars of the human psyche to note animal symbols in dreams, phobias and fantasies. Subsequent research has confirmed that animals are a common play and dream theme, particularly for young children. Children's books, toys, videos, television and the Internet are replete with animal characters. Virtual and robotic pets are expanding the boundaries of the human-pet relationship. In sum, children's environments are 'peopled' with both living and represented animals, real and imagined.

Since the contexts of development are important influences on children, in recent decades scholars have begun to focus on other animals, plants and natural settings, thereby expanding the focus of childhood studies beyond the traditional contexts of family, school, peer group, community, and culture. In addition, the theory of *biophilia*, first advanced in the book, *Biophilia*, by Edward O. Wilson in 1984, argued that humans had evolved to be selectively attentive to other life forms, particularly other animals. This theory, suggesting that children would have an innate interest in animals and other life forms, further spurred research on the role of animals, particularly pets, in children's development. A third influence stemmed from efforts to incorporate animals into therapeutic and educational interventions for children with special needs. Beginning with Boris Levinson's influential book, *Pet-Oriented Child Psychotherapy*, published in 1969, animal-assisted therapy, animal-assisted education, and animal-assisted enrichment activities have proliferated. While therapists and educators often report case studies of dramatic improvement in children's functioning, systematic research on the efficacy of animal-assisted interventions has lagged behind practice. However, evidence is accumulating to document beneficial effects of animal-assisted therapies in improving physical, social, and emotional functioning among children with specific impairments, such as cerebral palsy, autism spectrum disorder, and conduct disorder. Along with this research, studies of typically developing children have found that children often develop strong emotional

ties to their pets, making them important relationships in children's lives. These bonds allow many children to derive emotional support in times of stress, and may help develop empathy. Another line of research documents the role that caring for animals may play in developing children's interest in and ability to nurture. Of particular significance is the finding that boys and girls do not differ in caring for animals, despite the emergence of gender differences in caring for other humans. Research on the development of nurturance shows that by age five, boys perceive caring for other humans, such as babies, as a feminine activity and as a result, boys display less interest in and involvement in nurturing dependent humans than do girls. These findings, together with the frequent presence of pets in the home, make pet care an important opportunity for boys to nurture others.

Animals play a role in children's cognitive development as well. Studies of *naïve biology* explore how children develop early understanding, before formal biology education, of what it means to be alive, how other species differ from humans, how life forms grow, reproduce and die, and related issues. Exposure to living animals influences the development of these biological constructs. Finally, animals influence children's moral development. As children are reasoning about the morality of human relationships, children are also reasoning about human treatment of animals and their environments. Such reasoning may influence later stances concerning animal welfare, ecology, conservation, and species protection.

While the major focus of research has been on the potential benefits of animals for children's development, scholars of domestic violence and animal maltreatment have found that both tend to co-occur in families, posing risks to both child and animal welfare. These findings have led to collaborative efforts by child protective services and animal protection societies aimed at prevention, diagnosis and treatment.

General Resources

The journals, *Anthrozoos* and *Society & Animals*, are the most prominent publications devoted to current peer-reviewed articles on human-animal interactions and frequently feature scholarship on children and animals. Beck and Katcher 1996 provide an overview of how pets affect people of all ages, while Kahn and Kellert 2002 feature contributions from scholars who place children's involvement with animals in the broader perspective of nature experiences. For a general orientation to the role of animals, particularly dogs, for special populations at risk, the Handbook edited by Fine 2010 and updated every few years, is very useful. Several edited volumes by McCardle et al (2010, 2011) survey the field of human-animal interaction research related to children with contributions from leaders in the field. Melson 2001 is the only comprehensive analysis of animals in the lives of children, encompassing pets, wild animals, animal symbols, and therapies involving animals.

Anthrozoos. Peer-reviewed journal, first published in 1987, devoted to scholarly articles on human-animal interaction, with numerous articles about children and animals. Useful for both beginning and advanced students.

Beck, Alan and Katcher, Aaron 1996. *Between pets and people: The importance of animal companionship*. West Lafayette, IN: Purdue University Press. Written by two pioneers in the field of human-animal interaction studies, this paperback is an accessible overview of research and theory concerning the importance of pets for humans across the lifespan.

Fine, Aubrey H. 2010. *Handbook on Animal-Assisted Therapy*. (3rd edition). New York: Academic Press. Edited volume with latest research and best practices concerning animal-assisted therapies involving pets such as dogs, birds and horses. Several chapters focus specifically on children. Useful for practitioners as well as those who want an overview of the field of animal-assisted therapies.

Kahn, Peter H. Jr., and Kellert, Stephen R. 2002. (eds.) *Children and nature: Psychological, sociocultural, and evolutionary investigations*. Cambridge, MA: MIT Press. Edited by two leading scholars, the 12 chapters in this volume place children's interactions with animals within the context of nature experiences. Implications for cognitive, emotional, and social development are explored. Chapters on therapeutic, educational, and policy implications make this volume useful for students and practitioners alike.

McCardle, Peggy, McCune, Sandra, Griffin, James A., Esposito, L., & Freund, L. 2010. (Eds.) *The role of pets in children's lives: Human-animal interaction in child development, health and therapeutic intervention*. Baltimore, MD: Brookes Publishing. An outgrowth of a workshop of scholars convened by the National Institute of Child Health and Human Development (NICHD) and the Waltham Centre for Pet Nutrition in the United Kingdom in 2009, this edited volume critically reviews current research and theory and sets out a research agenda. Excellent for advanced students and scholars.

McCardle, Peggy, McCune, Sandra, Griffin, James A., & Maholmes, Valerie. 2011 (Eds.) *How animals affect us: Examining the influence of human-animal interaction on child development and human health*. Washington, D. C.: American Psychological Association. A followup to the McCardle, et al. 2010 volume, this compilation assesses the "state of the field" with respect to the role of animals in child development and its implications for physical and emotional well-being.

Melson, Gail F. 2001. *Why the wild things are: Animals in the lives of children*. Cambridge, MA: Harvard University Press. Comprehensive overview of the role of animals in children's development, with emphasis on the role of pets. Implications for parents, educators and therapists make this volume suitable for a general audience as well as scholars and students.

Society & Animals. Quarterly peer-reviewed journal, published since 1993. Includes articles on human-animal interaction and relations from many disciplines. Frequently includes topics related to children and animals. Excellent resource for current research in the field.

History and demographics

Because U. S. census data (as well as those in other countries) do not include information about non-human occupants of households, demographic information about pets in children's lives can only be estimated. Both the American Veterinary Medical Association (AVMA) and the American Pet Products Association (APPA) conduct periodic national surveys of pet ownership and preferences. These surveys are the best available indicators of pet demographics. Demographic information concerning children's contacts with non-pet animals (for example, frequency of visits to zoos and nature parks) is even more sparse and imprecise. In addition, a historical perspective is important, since many aspects of human attitudes and behavior toward animals changes over time. Indeed, as Hines 2003 shows, the field of human-animal interaction studies is of recent origin and is still emerging. Grier 2006 provides the best historical overview of the evolution of pet-keeping within the U. S. Clancy and Rowan 2004 is a useful supplement to this work.

www.americanpetproducts.org. Website of the American Pet Products Association, which conducts annual surveys of pet ownership in U. S. households. Provides useful survey data on households with children.

Clancy, Elizabeth A. and Rowan, Andrew N. 2004. Companion animal demographics in the United States: A historical perspective. In *The state of animals* (Deborah J. Salem and Andrew N. Rowan, Eds.) Washington, D.C.: Humane Society Press, 9-11. Places statistics on pet-keeping within a historical perspective.

Grier, Katherine C. 2006. *Pets in America: A History*. Chapel Hill, NC: University of North Carolina Press. Within a comprehensive account of American pet-keeping, particularly between 1840 and 1940, this history traces the origin of views on the connections between children and pets. Excellent illustrations and a lively writing style.

Hines, Linda. 2003. Historical perspectives on the Human-Animal Bond. *American Behavioral Scientist* 47: 7-15. An overview of the development of the concept of the human-animal bond and its use by scholars and practitioners, written by a pioneer in this field. Useful general background for general reader as well as scholar.

2007 U. S. Pet ownership and demographic statistics Sourcebook. Schaumburg, IL: AVMA. Although somewhat dated, this sourcebook, compiled by the American Veterinary Medical Association (AVMA), presents the most comprehensive and reliable demographic information about pet ownership in

the U. S. Statistics are available for households with children. Updated approximately every five years. Some summary statistics also available on the website:

www.avma.org/reference/marketstats/ownership.asp

Animals and child development

Scholars of child development have only recently begun to investigate how animals influence children's cognitive, social, emotional, and moral development. Endenberg and van Lith 2011 provide a context for this emerging field. The influence of animals, especially pets, on children's social and emotional life has been the primary focus of research. Myers 1998 stands out for its detailed observations of young children encountering animals within preschool settings. With respect to cognitive development, Inagaki and Hatano are among the leading researchers on the development of children's initial ideas about biology (before formal instruction). Their 2002 volume is an excellent synthesis of their own and related work on this issue. Supplementing this volume are more recent investigations by Prokop et al 2008 and DeLoache et al. 2011. Prokop et al. 2008 provide a much needed international perspective with their study of Slovakian children. DeLoache et al 2011 bring leading scholars of early cognitive development to focus on the emerging thinking of young children about animals. Kellert 1997 has written the most influential scholarship on how attitudes toward animals, particularly wild animals, changes as children develop.

DeLoache, Judy S., Pickard, Megan Bloom, & LoBue, Vanessa. 2011. How very young children think about animals. In McCardle, Peggy, McCune, Sandra, Griffin, James A., & Maholmes, Valerie. (eds.) *How animals affect us: Examining the influence of human-animal interaction on child development and human health*. (pp. 85-99). Washington, D. C.: American Psychological Association. Leading researchers present evidence of interest in animals from infancy. Suitable for scholars of children's early cognitive development as well as of human-animal interaction.

Endenberg, Nienke and van Lith, Hein. 2011. The influence of animals on the development of children. *Veterinary Journal* 190: 208-214. Timely review of relevant studies, within a theoretical framework, while noting methodological weaknesses and implications for animal-assisted therapies with children.

Inagaki, Kayoko and Hatano, Giyoo. 2002. *Young children's naïve thinking about the biological world*. New York: Psychology Press. Two leading researchers explain how children develop ideas about living beings such as animals and plants. Of scholarly interests primarily, with implications for teaching biology.

Kellert, Stephen R. 1997. *Kinship to mastery: Biophilia in human evolution and development*. Washington, D. C.: Island Press. Presents an influential account of how attitudes toward animals change

as children develop. Primarily for students and scholars, but useful also for those generally interested in human-animal connections.

Myers, Gene. 1998. *Children and animals: Social development and our connections to other species*. Boulder, CO: Westview Press. This volume documents in rich detail year-long observations of young children in preschool classrooms as they encounter and respond to a wide variety of animal species. An excellent example of participant observation methods for the scholar and student.

Prokop, Pavol, Prokop, Matej, & Tunnicliffe, Sue D. 2008. Effects of keeping animals as pets on children's conceptions of vertebrates and invertebrates. *International Journal of Science Education* 30: 432-499. Well conducted, large scale study of Slovak children showing how pet-keeping is positively associated with increased knowledge of the internal organs of animals.

Animals in therapies and education

Therapeutic and educational programs linking children and animals have proliferated in recent decades, particularly in North America and Western Europe. In the 21st century such programs are rapidly proliferating throughout the globe. For historical context, two excellent sources are Levinson 1997, an updated and revised edition by the person considered the founder of animal-assisted psychotherapy with children and Ross 2011, a historical account of perhaps the most influential residential treatment program for emotionally disturbed children. Both are valuable roadmaps for those who want to design or improve similar programs. Additional practical information for those who wish to certify their animals (usually a dog) as a therapy animal is found at www.deltasociety.org. More recent applications of animal-assisted therapy are found in Krskova et al. 2010 and Parish-Plass 2008. Both extend work on animal-assisted therapy to Eastern Europe and Israel, respectively. Educational interventions with animals generally have received less scholarly attention than therapeutic interventions with animals. Montagner 1995, focusing on French children, stands out for its comprehensive treatment of such educational interventions.

www.deltasociety.org. Website of the Delta Society, now called Pet Partners, a major resource for information, training and certification of therapy animals. The website has links to online courses, bibliography of scholarship on the health benefits of animals for children, and information on service animals. Importantly, the website is careful to distinguish between training as a therapist (not available through www.deltasociety.org) and training to partner with one's therapy dog.

Krskova, Lucia, Talarovicova, Alzbeta, and Okxova, Lucia. 2010. Guinea pigs – the 'small great' therapist for autistic children, or: Do guinea pigs have positive effects on autistic children's social behavior? *Society & Animals* 18: 139-151. Provides observational evidence that the presence of a guinea pig enhances human-directed social behaviors of children with autism. Useful for scholars as well as those designing and evaluating programs for children with autism spectrum disorder (ASD).

Levinson, Boris M. 1997. *Pet-oriented child psychotherapy*. 2nd edition. Revised and updated by Gerald P. Mallon. Springfield, IL: Charles C. Thomas, Publisher. A classic, originally published in 1969, by the founding father of animal-assisted therapy with children. Still one of the best descriptions of how pets may aid the therapeutic process, with vivid case study examples.

Melson, Gail F., and Fine, Aubrey H. 2010. Animals in the lives of children. In Aubrey H. Fine (ed.), *Handbook of Animal-Assisted Therapy*. 3rd edition. NY: Academic Press. 223-245. Summarizes evidence for effects of pets on children with implications for animal-assisted therapies, including guidelines for program development. Useful as background for practitioner and scholar.

Montagner, Hubert. (1995). *L'enfant, l'animal et l'école*. Paris: Bayard Editions/AFIRAC. Written with a team of 18 French scholars and practitioners, this volume explains why living animals help children in their classrooms and guides teachers in how best to incorporate them. (in French).

Parish-Plass, Nancy. 2008. Animal-assisted therapy with children suffering from insecure attachment due to abuse/neglect: A method to lower risk for intergenerational transmission of abuse. *Clinical Psychology and Psychiatry* 13:7-30. Written by a therapist experienced in the use of animal-assisted therapy (AAT) with children, this article presents principles of AAT within a clear conceptual framework. Excellent clinical examples make this most useful for the therapist.

Ross, Samuel B., 2011. *The extraordinary spirit of Green Chimneys: Connecting children and animals to create hope*. West Lafayette, IN: Purdue University Press. The founder of a pre-eminent treatment center for children recounts the history, mission and accomplishments of therapeutic and educational programs at Green Chimneys Children's Services. This facility has been a model internationally for incorporating animals and nature into a therapeutic milieu for emotionally troubled children.

Animals and children's health

The emphasis of scholarship and programs has been on the benefits of animals for children's health. Headey and Grabka 2007 present epidemiological evidence, from two distinct societies, that having a pet is associated with reduced use of health care. The obesity epidemic in North America and elsewhere has spurred interest in the possibility that pets, particularly dogs, may increase physical activity in children and adults. Salmon and Timperio 2011 provide a useful overview of this issue, while Sirard et al. 2011 present suggestive if not conclusive evidence in support. In addition, attention has been paid to possible (and preventable) health risks associated with pet-keeping and animal contact in general. Since children are the major victims of dog bites, dog bite prevention programs through educating children and their parents are important. Jalonga 2008 is an excellent guide, useful for teachers, parents and the general public, on improving children's safety around dogs. A controversial area of scholarship is the relationship

between pet-keeping (and more generally contact with animals) during childhood and asthma and allergies. The “hygiene hypothesis” contends that early exposure (during prenatal development and the first year of life) is protective against later development of childhood asthma and allergies. Kerkhof et al 2009 presents important data in support of this view. Other researchers caution that evidence for the “hygiene hypothesis” is not strong; Takkouche, et al. 2008 represent this position.

Headey, Bruce and Grabka, Marcus. 2007. Pets and human health in Germany and Australia: National longitudinal results. *Social Indicators Research* 80: 297-311. First study to report nationally representative samples followed over time. Although most studied were adults, adolescents 16-18 were included. This scholarly study is useful for its breadth and cross-cultural information. Demonstrates important health implications of pet ownership.

Jalongo, Mary Renck. 2008. Beyond a pets theme: teaching young children to interact safely with dogs. *Early Childhood Education Journal* 36: 39-45. Useful for teachers and parents, this article describes common situations that may pose dog bite risk for young children and recommends interventions. Reader-friendly tables of additional resources and key dog safety behaviors make for handy references.

Kerkhof, Marjan, et al. 2009. The effects of pets on asthma development up to 8 years of age: The PIAMA study. *Allergy*, 64: 1202-1208. A large scale prospective study of Dutch children from birth to age eight, showing that cat or dog exposure during infancy is protective against later sensitization to inhalant allergens, such as dust mites and pollen, but not protective against asthma. Useful for scholars weighing evidence for and against the “hygiene hypothesis.”

Salmon, Jo and Timperio, Anna. 2011. Childhood obesity and human-animal interaction. In McCardle, Peggy, McCune, Sandra, Griffin, James A., & Maholmes, Valerie (eds.). *How animals affect us: Examining the influence of human-animal interaction on child development and human health*. (pp. 139-152). Washington, D. C.: American Psychological Association. Reviews evidence on role of pets, particularly dog walking, on childhood and adult obesity. Suggests future directions for research.

Sirard, John R., Patnode, Carrie D., Hearst, Mary O., & Laska, Melissa N. 2011. Dog ownership and adolescent physical activity. *American Journal of Preventive Medicine* 40, 334-337.

Takkouche, B., Gonzalez-Barcala, F. J., Etmnan, M., & Fitzgerald, M. 2008. Exposure to furry pets and the risk of asthma and allergic rhinitis: A meta-analysis. *Allergy* 63: 857-864. Assesses health risks of furry pets through statistical analysis of over 3,000 studies are reviewed.

Children and animal welfare

Scholars, educators and practitioners are concerned not only with the potential benefits of pets and other animals for children’s development, but also with the welfare of these animals. In North America, the

American Humane Society, the Humane Society of the United States and the National Association for Humane and Environmental Education are the major organizations focused on educating children about animal welfare issues. Their websites, www.americanhumane.org, www.hsus.org, and www.nahee.org, are excellent clearing houses for information about programs. In addition, researchers have documented an association among domestic violence, child abuse and animal abuse. Ascione and Arkow 1999, leading scholars and advocates, gather this evidence comprehensively and persuasively. Mellor et al. 2009 extends this work with a cross-national perspective. Beyond documenting these links among abuse victims, scholars and practitioners also are focused on prevention and treatment. Mariti et al. 2011 show the possibilities of even a short term educational intervention.

www.americanhumane.org. The website of the American Humane Organization (AHO), which provides educational materials and brochures. The AHO sponsors Be Kind to Animals Week, an educational curriculum on animal welfare for schools.

Ascione, Frank R., & Arkow, Phil. (eds.) 1999. *Child abuse, domestic violence, and animal abuse: Linking the circles of compassion for prevention and intervention*. West Lafayette, IN: Purdue University Press. Edited by two leading specialists in problems of animal abuse, this comprehensive collection covers connections among animal abuse, child abuse and domestic violence, legal contexts, and effective programs for prevention and intervention. Offers specific recommendations useful for program personnel, advocates and concerned citizens as well as students of the subject.

www.hsus.org. The website of the Humane Society of the U. S. whose BARK program for kindergarten through fifth-grade emphasizes “Be aware, be responsible, and be kind” as ways to sensitize children about animal welfare issues, particularly with pets.

Mariti, Chiara, Papi, Francesca, Mengoti, Manuel, Moretti, Graziana, Martelli, Franco, and Gazzano, Angelo. 2011. Improvement in children’s humaneness toward nonhuman animals through a project of educational anthrozoology. *Journal of Veterinary Behavior* 6, 12-20. Demonstrates that a short term educational program about dogs, cats and rabbits can improve Italian school children’s knowledge about and humane attitudes toward these animals. Useful for scholars and educators.

Mellor, David et al. 2009. Childhood cruelty to animals: A tri-national study. *Child Psychiatry and Human Development* 40: 527-541. Only large-scale cross-cultural study of self-reported cruelty to animals among children. Useful for scholars and students interested in animal welfare issues across multiple cultures.

www.nahee.org. The website of the National Association for Humane and Environmental Education, which provides a curriculum on animal welfare for preschool through third-grade levels and publishes the newsletter *Kind News*.

Technological pets

As digital technology proliferates, robotic and virtual pets are becoming more common. This raises questions about the similarities and differences between children's experiences with living and with technological pets. Gail Melson and Peter Kahn, with their colleagues, present a program of research on children's responses to and ideas about AIBO, a robotic dog, exploring the social, emotional, and moral dimensions of relating to a robotic "pet." Chen, et al. 2011, focusing on computer generated virtual pets, shows that they may help sustain attention and learning on a cognitive task.

Kahn, Peter, Friedman, Batya, Perez-Granados, Deanna R., & Freier, Nathan G. 2006. Robotic pets in the lives of preschool children. *Interaction Studies: Social Behavior and Communication in Biological and Artificial Systems* 7, 405-436. Careful observational and interview study of young children with AIBO, a robotic dog, in comparison to a stuffed toy dog. Provides a template for assessing a wide range of children's responses to technological pets. For scholars and researchers.

Melson, Gail F., Kahn, Peter H. Jr., Beck, Alan, and Friedman, Batya. 2009. Robotic pets in human lives: Implications for human-animal bond and for human relationships with personified technologies. *Journal of Social Issues* 65: 545-568. Peer-reviewed scholarly article that presents studies of how children think about and respond to robotic dogs in comparison to living ones. Places research within a lifespan context and considers implications for children's relationships with living pets.

Chen, Zhi-Hong, Liao, Calvin, Chien, Tsu-Chao, & Chan, Tak-Wai. 2011. Animal companions: Fostering children's effort-making by nurturing virtual pets. *British Journal of Educational Technology* 42: 166-180. One of very few studies to demonstrate how virtual pets may enhance children's attention, satisfaction and achievement on a learning task. This study of Taiwanese children learning Chinese idioms illustrates cross-cultural implications of virtual pets as an educational tool. Suitable for scholars.

