Henri Julius · Andrea Beetz · Kurt Kotrschal
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Attachment to Pets

An Integrative View of Human-Animal Relationships with Implications for Therapeutic Practice

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About the Authors

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Foreword

In recent years, the ancient symbiosis between humans and their pets has entered a new phase, marked by the burgeoning clinical specialty of human–animal therapy. This therapeutic approach applies the intuitive understanding between humans and their (mainly) mammalian pets to support the growth of emotion regulation, social skills, and mental health in children, adolescents, and adults. It takes no special knowledge to appreciate the promise of this approach: Just ask any child who ever yearned for Lassie to find her way home or wished that "Nana," the nursery pet of the Darling children, could keep guard over their sleep too (to name just two of the many stories that celebrate the special bond between children and animals). It is a simple fact, almost a commonplace, that our companionships with animals not only bring pleasure, but also promote our emotional health and well-being.

The authors of this important new work go far beyond this basic appreciation to ask "why?" What makes it possible not only for members of different species to develop close bonds, but also for animals to have a therapeutic effect on their human companions? The authors of this book represent a rare collaboration of biologists and psychologists and an equally rare integration of sophisticated biological and psychological knowledge. Together they create a comprehensive, scientific foundation for human–animal therapy, a foundation that will facilitate the development, implementation, and evaluation of effective new interventions.

Fittingly, the book is organized in terms of the classic framework of ethology. Ethology is the field, established by such great zoologists as Niko Tinbergen, Konrad Lorenz, and Robert Hinde, which explores the biological roots of behavior. It was Tinbergen who proposed that in order to fully comprehend a behavioral phenomenon we must address four types of causality – adaptive function with respect to reproductive fitness and natural selection, evolutionary history, development of the behavior, and the physiological and psychological mechanisms required for its production and control. At its best, the ethological approach permits us to bridge the complexity of human experience, including the experience of the human–animal relationship, with our biological heritage.

The authors present and explain key constructs, theories, and up-to-date findings from an extraordinarily wide range of topics relevant to human–animal relationships. From sociobiology come hypotheses about the general adaptive function and ubiquity of exclusive bonds. Generically, enduring bonds or relationships promote reproductive fitness by allowing one individual to monopolize the attention and resources of another and to reject competitors. That is, the building blocks of psychological reciprocity and altruism have their origins in competitive processes. Sociobiologically speaking, human–animal bonds should be all but impossible, but instead they have clearly been selected for the mutual advantage of both partners. Natural selection has been augmented by the intentional selection by humans to the benefit of both species. Indeed, as the authors point out, dog breeds have in part been developed for variations in this very capacity for establishing exclusive relationships: Whereas "working" and "hunting" dogs must accept many masters, "guard dogs" must be highly exclusive if they are to repel intruders.

The possibility of establishing a human–animal bond – or any enduring bond – rests upon brain features and functions derived from our remote, common ancestry with dogs. We share the phylogenetically very ancient network of loci in the fore- and midbrain that generate hormones and regulate social behavior and responses to stress. Indeed, as research has increasingly made clear, social relationships are both major sources of stress in the life of animals and also essential coregulating mechanisms for moderating and coping with stress. In addition, we appear to share with our pets the neuropeptide oxytocin, which may be thought of as the essential "lubricant" for social bonds of all types – those between parents and offspring, between mating and other social partners, and between humans and their pets. Oxytocin has receptors throughout the central nervous system, and it serves key social functions (in addition to its role in labor and breastfeeding). These include facilitating proximity to and social interaction with various partners, reducing anxiety and inducing calm, and increasing pain thresholds. Notably, oxytocin is released in both humans and animals as a consequence of stroking, skin-to-skin contact, and, possibly, shared gaze. This effect is enhanced between humans and their trusted pet dogs.

The scientific study of human attachment and caregiving bonds has its origins in ethology as well. Attachment theory was first proposed in the 1960s and 1970s by the psychoanalyst John Bowlby and operationalized by Mary Ainsworth to provide a sound scientific basis for the "nature of the child's ties." After more than 50 years of research derived from this theory, attachments in infancy and throughout the life cycle are now generally understood to have their basis in neurobehavioral systems, a construct well established in ethology and borrowed by Bowlby. The theory of the coadapted caregiving behavioral system, posited by Bowlby and elaborated by Solomon and George, was similarly founded on ethological principles. A behavioral system permits the individual to organize behavior flexibly around a goal that has an important adaptive function. In the case of attachment, the hypothesized internal goal is "felt security," usually achieved through maintaining proximity to a particular caregiver. In the case of caregiving, the goal is "felt child security," usually achieved through proximity to and, if necessary, retrieval of the child. The brain pathways described above are now known to form key elements of these behavioral systems.

Completing an intellectually satisfying circuit, the authors go on to apply what we know about attachment and caregiving in humans to elucidate the human–animal bond, including why these bonds have potential therapeutic action that human–human relationships do not always have. Contemporary attachment theory has progressed quite far in understanding how human attachment–caregiver relationships reflect both the history of dyadic interaction and the parent's and child's mental representations (internal working models) of their mutual relationship. Mental representations facilitate behavioral efficiencies and stability of relationships, but they can also lead to behavioral rigidity and maladaptation. This occurs when the child's representation of the parent–child relationship is generalized to new relationships, such as when the maltreated child brings expectations of abuse or abandonment to relationships with teachers, friends, and marital partners. The authors suggest that pets, adapted for relationships, but lacking the cognitive complexity and needs of human partners, can provide "set-breaking" experiences for both children and adults, resulting in profound psychological change.

The integration of knowledge from the biological and psychological domains that is achieved in this work has great potential to improve communication between usually distinct specialties and to inspire new kinds of research and practice. How, for example, might we assess an animal's representational models of relationship and what other apparently human cognitive features might guide the behavior of pets? Can we do a better job of matching the needs of a particular human with the capabilities of the animal so as to improve the therapeutic effects of these relationships? What more can we learn about human behavioral disorders from observing symptomatic children or adults with a particular disorder in their interactions with certain animals? The synthesis achieved in this volume has equal value for those who focus mainly on human relationships: There is no better or more complete summary of the biological basis of human bonds available. We know from past experience how fruitful the collaboration between biologists and psychologists can be. We have every reason to expect the present volume to have an equally profound effect on both fields in years to come.

Judith Solomon
Oakland, CA, March 2012

Foreword

Humans – with some notorious exceptions – love their pets. The exact character of a loving relationship is the theme of this excellent book, but nobody could deny the intense grief felt by most human pet owners when their animal companions die. Given the longevity of most pets relative to that of humans, such grief is almost inevitable. The role of the animal's early experience in forming a reciprocal relationship with humans has been known for years, but the necessary conditions for its establishment have been more controversial. Initially, the view was that a window of opportunity for establishing an attachment is opened and then closed by endogenous growth processes. The so-called critical period was regarded as having sharp boundaries. However, work on behavioral imprinting in birds led to a revision of these views. Not only was the concept of a one-shot process, strongly implied by the imprinting term, found to be incorrect, but also the period in which the learning process takes place is much more flexible than had previously been thought. Restricting the animal's experience, for instance, was found to lengthen the period of susceptibility. The term "critical period" was replaced, therefore, by "sensitive period."

The change in thought gave rise to the concept of competitive exclusion, the idea being that as the animal formed a preference for one companion, the likelihood of it forming a preference for another readily distinguishable potential companion steadily diminished. These ideas transferred over to research on dogs and cats. In dogs, the period over which exposure to humans is an effective means of socialization extends to well after the puppies start to take solid food. The precise amount of contact is not critical – little exposure and often from early on is an effective way of establishing a bond. If that is not possible, much more contact after weaning is an acceptable alternative. However, leave the contact too late – roughly 12 weeks after birth – and the puppy will generally not make a good pet. Under special conditions dogs that have not been socialized to humans early in life may subsequently become deeply attached to their human companions – but usually after a period of chronic stress.

These general conclusions also apply to cats. My wife and I have bred pedigree cats in a small way for many years. When we had large litters (six or more), some of the kittens were very small, particularly the last ones to be born. These small members of the litter had difficulty in competing for a good nipple when faced with the scrabbling of their bigger siblings. In these cases we gave them artificial cat's milk through a syringe. They soon became so adept at sucking milk powerfully from the syringe that we did not need to press the plunger. When these kittens became more active, they would come out of the nesting box when we were close by and cry for their extra feed. Unsurprisingly, these kittens made wonderful pets later in their lives.

Some aspects of the human–animal relationship reflect more on the oddities of human behavior than those of the animals. Some pet owners want to care for animals that are prone to walking difficulties, epileptic fits, heart disease, eye deformities, breathing difficulties, infected skinfolds, and many other exaggerations of conformation or poor health resulting from misguided breeding practices. For some breeders, but by no means

all such owners, the interest in breeding dogs and cats lies in their animals doing well at shows. Others fall in love with a breed, and caring for an animal with health or welfare problems is an expression of that love. Whether such behavior on the part of the humans is justifiable is another matter.

However, this book is not about welfare issues but about the attachment processes in the animals that can give humans so much pleasure and help; and how knowledge about such processes can be generalized. Much has been learned from the formation of attachments in humans stimulated by the work of John Bowlby, Robert Hinde, Mary Ainsworth, and many others. The necessary hormonal conditions for mammalian bonding have also been revealed. The importance of oxytocin in the formation of human–animal attachments is central. Such knowledge feeds into the therapeutic uses of animals and their roles in helping humans. These advances form the core of this extremely welcome book.

Sir Patrick Bateson
Cambridge, UK, February 2012

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1 The Mysterious Relationship Between Humans and Animals

We start our book with a set of true stories that demonstrate how intensely humans may relate to animals and how these relationships may, in a mysterious way, be beneficial for these humans.

Pomai, a 2-year-old girl, lived in a big city. Every day when her dad took her out in the stroller she was exposed to many different sights. She rarely reacted to these cues. However, when Pomai saw a pigeon or a dog she became very excited and agitated. She pointed her finger at the animal and called "doggie, doggie, doggie" or "birdie, birdie, birdie" while she smiled at her dad.

Tim, a 7-year-old boy, had lost both of his parents to a heroin overdose 6 months before he entered play therapy. During the first 2 months of treatment, Tim was extremely withdrawn. Although he was able to recall what happened he seemed emotionally numb. This changed dramatically when the therapist's dog, Toto, was present during a session. Toto greeted Tim enthusiastically when he entered the room and Tim reacted positively. First he stroked and then he hugged the dog. Tim, who had never asked about anything during a session, persuaded the therapist to bring Toto again the next time. During the following sessions, Tim stroked and hugged the dog much of the time. Once, Toto licked his cheeks and Tim began to cry. He hugged Toto and continued to cry for almost half an hour while he told the dog about the death of his parents. In the subsequent sessions the therapist was able to establish a trustful relationship with the boy, which allowed him to work through the trauma of loss.

Eva and Olle had been married for 20 years. Olle had held a high position in the textile industry, but he had retired 10 years previously. Eva, who was 10 years younger, worked as a therapist and was still very active. She worked long hours and travelled a lot. Olle was bored and felt lonely and useless. He complained all the time and wanted Eva to stop working and to spend more time with him. This annoyed Eva because she loved her work and had no intention of quitting. Their relationship became tense and they quarreled all the time. In an attempt to solve these problems, they bought a puppy dog. They both loved taking care of the little schnauzer, which brought out the nurturing and loving side in both of them. One year later, Olle found himself enjoying good company during the day and he no longer tried to keep Eva at home. After a while, the loving behavior he shared with their dog started to spread to his partner and the atmosphere between them became more pleasant.

Mrs. Bray's health started to deteriorate when she lost her husband and her two closest friends within 4 years. She had difficulties walking and also became rather forgetful. Her three children and her grandchildren all lived in other towns. On her 76th birthday she decided to move to an assisted-living facility close to her oldest daughter, Pam. However, already rather depressed, her feeling of loneliness worsened after she moved.

She missed her home and her old neighbors, and she did not befriend the other residents. One day, a group of researchers from the university met the residents and informed them about an experiment, asking who would be willing to participate in a study and would like to have a parakeet. Since Mrs. Bray had kept pets when her children were little, she volunteered and was selected to receive a bird. Fritzi changed her life. Caring for him and talking to him made her realize how much she had missed being needed. It became easier for her to get up in the morning, and she even went out to get a book on birds. Mrs. Bray got to know the other bird owners, and they talked about the health, the behavior, and the feeding habits of their small companions. Mrs. Bray could not believe how much joy a little bird like Fritzi had brought back into her life.

Learning to read was difficult for Bill, a 7-year-old second-grader. Every time he had to read in front of his teacher or his classmates he expected to fail. His heart beat faster and got tense. He often mixed up the letters, stuttered, his classmates laughed, the teacher shook his head, and Bill experienced a mental block. He could not read anymore, not even a single word. In the meantime, Bill also refused to practice reading at home. Then, Bill attended an animal-assisted reading program for 6 weeks. Instead of reading to a teacher or in front of a class, he read a story to therapy dog Scooter every second day. When Bill read to Scooter, he was very motivated. Every evening before meeting the therapy dog at school, he chose a story from his own books to read to Scooter the next day. When Bill read to Scooter, he sat next to the dog and stroke him. Thereby, Bill calmed down and did not feel tense anymore. After that, he made good progress in reading.

Pauline was a first-grader who liked to attend school. However, when her parents asked her how she was doing in school, Pauline only answered "good." To get more information, Pauline's dad regularly invited his daughter for a horse ride. While Pauline sat on the horse and her dad walked next to her, she started, unprompted, to tell him what had happened at school the previous days.

Connor, 25 years of age, had spent the previous 2 years of his life in prison. Growing up in the suburbs he had got involved in gang activities, sold drugs, and one day got into a fight. He had been sentenced to 10 years in prison for severely injuring his opponent with a knife. This had come as a wake-up call, and Connor managed to observe the rules in prison. Because of this he was allowed to participate in a program where prisoners work with mustangs to make the animals more gentle and suitable for riding therapy for disabled patients. He had had no contact with horses before, but when he was first introduced to Peppermint he immediately felt a connection to this once wild horse that he was supposed to train to be reliable and gentle. Teaching Peppermint not to be afraid of sudden movements, strange noises, and unusual objects was difficult at the beginning because Connor was impatient and became loud and aggressive with Peppermint. However, with the help of the trainer, he learned to understand Peppermint's fear, and to help the horse relax in different surroundings, also by controlling his own impulses. Connor especially liked to take care of Peppermint after the training, brushing him, feeding him a treat, and sometimes just leaning against his strong friend. Even though having a job and working hard had not been a part of his previous life, it became very important for him to take good care of Peppermint within a few weeks. Connor had to stay in prison for many more years, while Peppermint moved on to the task he was

trained for, working in hippotherapy with children with disabilities. Connor wept when he had to say goodbye to his friend with whom he had spent a month and to whom he had grown close.

John, a 37-year-old successful and busy stockbroker on Wall Street, lived with his wife and two children in their privately owned house in New Jersey. He had worked hard for 2 years, paying off the mortgage, but having little time for his family. On his way home one day, he collapsed with strong chest pain. It took him several weeks to recover from this heart attack. Even though it did not seem to be the ideal time to acquire a pet, he and his wife decided to fulfill their daughters' wish and they adopted Spot, a dalmatian mix from a shelter. Although John had owned pet dogs as a child, he was surprised at how much he enjoyed spending time with Spot, playing with him and the girls, and going for walks. After a while, John observed that he felt more relaxed, despite having started work again (although in a different position). After 4 months, he had also become more relaxed about Spot's training, allowing him to be on the couch and even at the foot of the bed in the mornings. John's health stabilized and his blood pressure was nearly normal, as the regular doctor visits documented.

Martha, a 9-year-old girl, was referred to special education because she displayed severe behavioral problems. Martha lived at a children's home because her parents had neglected and physically abused her. She was aggressive toward her peers and rejected all adult caregivers, also in this special education setting. Martha became increasingly withdrawn in the presence of the special education teachers. One day a teacher brought her dog, Willy, with her because her mother, who usually cared for the dog in the mornings, had had to go into hospital for a few days and she did not dare leave the dog alone at home or in the car. When Martha first saw Willy, she bent down and called to him. He ran up to the girl and began licking her in greeting. For the rest of the morning Martha stayed close to Willy. The girl – who had never approached her teacher before – asked if she could feed the dog. At the end of the school day she even dared to ask the teacher whether she could bring Willy with her again the next day. Luckily the special education teacher realized that it might be easier for her to reach Martha when the dog was present. In the course of the next few weeks, Martha became a real caregiver for the dog. She fed Willy, brushed him, and also walked him during recess. The teacher could now approach Martha without being rejected, especially when the girl was close to the dog. As the teacher later stated, this was the beginning of a trusting relationship between Martha and herself.

These case stories are very different, but they have something in common. In fact, they illustrate the multitude of effects often associated with human–animal relationships. Most humans seem to have a keen interest in animals that often manifests itself in a relationship that has the potential to reduce anxiety and stress (including blood pressure and other autonomic functions), to positively affect dispositions toward aggression and depression, and to facilitate social communication, access to one's own emotional states, trust in others, and learning.

To investigate whether such potentially beneficial and even curative effects can be attributed to the relationship between humans and animals, it is first necessary to discuss whether humans and animals can form "true" relationships at all, that is, relationships that meet at least the fundamental, biopsychological criteria of close social relationships

between conspecifics. A behavioral biology and evolutionary view in chapter 2 reveals that humans and animals share brain and physiological structures and mechanisms that underlie social behavior. This is the base and prerequisite for humans and their companion animals to be able to establish true relationships.

If humans can indeed engage in true social relationships with their companion animals, the next question would be whether the curative effects reported above can be attributed to these human–animal relationships. A review of potential effects that have been associated with human–animal interactions in chapter 3 reveals that this is probably the case.

In chapter 4**,** we discuss whether the curative effects associated with human–animal relationships can be attributed to a deeper structure that connects these effects. We have identified the oxytocin system as one such fundamental structure. Oxytocin is produced in the hypothalamus and acts both as a hormone and as a neurotransmitter. Oxytocin has been demonstrated to be involved in similar ways in the social interactions and behavior of different mammalian species. A widespread distribution of oxytocin-containing nerves allows for an integration of different oxytocin-mediated effects when this system is activated. Results from studies on humans and on nonhuman animals show that oxytocin release is triggered by certain kinds of social interactions and touch and may, in turn, induce a multitude of effects, particularly in the social domain. In connection with the topic of this book, it is of particular interest that oxytocin (a) decreases anxiety, stress, aggression, and depression, (b) stimulates and facilitates social interaction and communication, (c) increases trust in others, and (d) facilitates learning and access to emotional states. Since all these effects have been associated with human–animal relationships, the oxytocin system will be introduced and discussed as the central neurobiological structure behind these effects.

The release of oxytocin is not caused by just any social interaction. Rather, oxytocin release, including the oxytocin-mediated effects, requires a certain relationship quality. We suggest that such a relationship quality can best be described and differentiated via the psychologically defined concepts of attachment and caregiving. These concepts have been developed over the past few decades in the domain of interpersonal human relationships. Therefore, we first introduce these concepts in chapter 5 in the framework of their original scope before applying and extending them to human–animal relationships.

"Attachment" originally referred to a persistent emotional tie between a child and a caregiver. More recently, the concept of attachment has been expanded to include other types of relationships, such as romantic love. The function of the attachment system is to maintain or establish proximity between a child and its attachment figure, particularly when the child is stressed or in danger. In so-called securely attached children, fear and stress are reduced by proximity to the caregiver. Therefore, the attachment system serves to protect the offspring, ensures caregiving, and reduces stress, particularly on the part of the dependent. Since the attachment system is flexible, it adapts not only to supporting conditions, but also to a suboptimal or even negative environment. If a child is exposed to parental neglect, to inconsistent parental care, or even to abuse, this child will not be able to develop a secure attachment pattern. In fact, three different types of insecure attachment representations have been identified: insecure-ambivalent, insecure-avoidant, and disorganized. Children with insecure attachment styles hardly experience

relief of fear and stress in the company of their parents, and children with a disorganized attachment pattern may even be stressed by their caregivers. These children in particular display a wide range of psychological symptoms.

The most important factor for the quality of a child's attachment is the caregiving behavior of his or her attachment figure, including maintaining proximity through retrieval, calling, seeking eye contact, smiling, comforting, and body contact (e.g., carrying, stroking). The quality of caregiving can be measured along the dimensions of sensitivity and responsivity. Sensitivity refers to the caregiver's ability to correctly perceive and interpret the child's signals for proximity. Responsivity describes the degree to which the caregiver responds adequately to these signals. Four model types of caregiving have been identified that correspond to children's secure and insecure attachment patterns.

Considerable evidence supports a connection between the oxytocin system and attachment and caregiving. This link is the topic of chapter 6. Here, we discuss the fact that close contact between mother and infant is associated with oxytocin release and the expression of oxytocin-related effect patterns in both mother and infant. Thereby, social interaction is facilitated and anxiety and stress levels are reduced. We assume that later in the child's development, oxytocin is released not only in the presence of the mother but also in the presence of other caregivers. Since the down-regulation of stress is one of the central functions of the attachment system, securely attached children seem to have developed a good tone or function in their oxytocin system from their relationships with their primary and subsequent caregivers. Complementary to that, a mother or father who displays adequate caregiving probably also has a good tone or function in the oxytocin system, while maladaptive caregiving is likely to be associated with an imbalance in the oxytocin system.

In insecurely attached children the attachment figure does not trigger an adequate oxytocin release and, hence, will fail to calm the child and reduce its stress. Primary caregivers of children with attachment disorganization – who often have experienced domestic violence or neglect – may even activate the children's flight-or-fight system, which is triggered by stress and associated hormones. Thus, these caregivers are not only incapable of relieving fear, anxiety, and stress in the children, but rather activate the opposite neurobiological systems. This is adaptive, as it alerts the child and readies the organism for potential danger. It also makes sense that these children do not trust their caregivers anymore – their attachment system has adapted to pathogenic conditions and this adaptation ensures their prevailing psychic survival, the children thereby make the best of a bad situation. This is, however, a dearly purchased adaptation because children who associate their primary caregiver with rejection or even danger will have learned not to turn to alternative sensitive, supportive, and trustworthy caregivers or social partners in emotionally stressful situations. This severely jeopardizes the further social development of such children.

Since attachment and caregiving are closely linked with the oxytocin system and since the positive effects of oxytocin overlap with the positive effects of human–animal relationships, we ask in chapter 7 whether human–animal relationships may be conceptualized as attachment or caregiving relationships. Empirical evidence suggests that humans establish attachment as well as caregiving relationships with animals. Research also suggests that insecure attachment and caregiving patterns, rooted in human–human