

PSYCHOLOGY OF RELATIONSHIPS

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EDITORS

Nova Science Publishers, Inc.
New York

2009

Chapter 4

**ANOTHER KIND OF “INTERPERSONAL”
RELATIONSHIP: HUMANS, COMPANION ANIMALS,
AND ATTACHMENT THEORY**

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ABSTRACT

Human-companion animal relationships provide a important but largely unexplored component of the human experience. Research examining these interspecies relationships may elucidate the depth and meaning of these relationships as well as provide unique insights into the fundamental nature of human psychology. Human-animal relationships offer a distinctive testing ground because pet choice is unilateral, whereas human friendships and romantic partner choices are mutual, and individuals may have reduced fear of rejection or evaluation from a pet than from a human relationship partner. We review and apply to human-pet relationships key elements of attachment theory, including caregiving, exploration, the malleability of attachment styles, and the role of attachment anxiety and avoidance in choosing relationship partners. We also discuss potential future research directions using relationships theories in companion animal contexts.

Human beings are social creatures, and as such have a fundamental need to belong (Baumeister & Tice, 1990; Leary, Tambor, Terdal, & Downs, 1995). We seek the security, support, and comfort of friends and family. It is therefore not surprising that the field of close relationships has been a central and burgeoning area within psychology. However, most close relationships theory and research overlooks the important fact that “interpersonal” needs can be met without other people per se. Individuals commonly attach themselves to objects, concepts, and abstractions to serve attachment and belonging functions. One particularly

prevalent and compelling type of attachment involves the one that humans have with non-human animals.

Individuals go to great lengths to form or maintain social connection. Gardner, Pickett, and Knowles (2005) proposed that individuals use one-sided ("parasocial") attachments to maintain belongingness when necessary. In two recent studies, Knowles and Gardner (2008) found that writing about or viewing a picture of one's favorite TV character (i.e., characters from the NBC show "Friends") buffered individuals from the negative emotional consequences of social rejection. Similarly, researchers have studied God as a "substitute attachment figure" (e.g., Kirkpatrick, 1998), including possible psychological and physical health benefits of feeling interdependent with a deity. Connection to nature in general also may foster a sense of belongingness. Frantz, Winter, and Mayer (2008) found that individuals who felt a strong connection to nature reported a higher sense of belongingness as a result of interaction with the natural world and were psychologically shielded from the effects of social rejection. If individuals feel a connection to and appear to benefit from a relationship with intangible or invisible characters, it stands to reason that significant benefits may accrue from relationships with animal companions.

Though relationships with some animals (e.g., fish) may be relatively parasocial or one-sided, relationships with other common pets, such as cats and dogs, clearly provide companionship, physical contact, and comfort. Human-animal relationships are profoundly important ones, and pets frequently are treated as family members. Though the influence of pets on human well-being has been investigated, little theoretically based work has been conducted to fully explicate the psychology of these relationships. Human-animal relationships are different from interpersonal relationships in many ways. Unique characteristics of the human-animal relationship (e.g., ability of humans to unilaterally choose their animal companions, reduced fear of evaluation by animal companions) provide an opportunity to examine human psychology in contexts unavailable to traditional human-human relationships. That is, a closer investigation of human relationships with animals may extend our understanding of human cognition, emotion, and behavior.

In this chapter, we provide a selective review of some research on human-animal relationships to demonstrate that these relationships have a significant impact on the human experience. At the same time, we argue that researchers have just scratched the surface of this potentially rich field and should investigate human-animal relationships using available interpersonal relationship theories and methods. Our review will draw primarily upon the important theory of attachment (Bowlby, 1969) as one example of an appropriate theory to extend to human-animal relationships. Finally, we propose ways in which human-animal relationships can be used to both examine and extend traditional psychological theory, and suggest new avenues of research in order to advance our understanding of human-animal relationships. We begin by providing some background on the evolution of the most common pets (i.e., cats and dogs) as an initial basis for explaining the prevalence and depth of human-animal relationships.

CO-EVOLUTION OF HUMANS AND ANIMALS

The dog-human relationship is arguably the closest we humans can ever get to establishing a dialogue with another sentient life-form, so it is not surprising that people tend to emerge from such encounters with a special sense of affinity with 'man's best friend.' James Serpell (1995), p. 2

Companion animals vary widely from fish to birds to several species of mammals, but canine-human relationships have a particularly long evolutionary history. Descended from the grey wolf (Vila et al., 1997), modern domestic dogs (*Canis familiaris*) were the first animals that humans domesticated at the end of the last Ice Age, approximately 15,000 years ago (Serpell, 1995). One account suggests that this domestication accompanied the hunting shift to early archery; domesticated dogs facilitated successful hunting by helping track herds and subdue wounded prey (Serpell, 1995). However, a more radical view by Schleidt and Shalter (2003) argues that humans and wolves, both omnivores and both relatively cooperative, group-oriented species, started following herds in Eurasia around the same time, and thus co-evolved as joint partners in obtaining food. In either case, it is notable that humans domesticated dogs before domesticating the animals that have provided them with their most common sources of animal protein (e.g., cattle, goats, pigs), animals whose domestication requires less nomadic living.

Whether through domestication or co-evolution, the long history of dogs living with humans has led dogs to understand verbal and non-verbal communication from humans. Scientific views about the abilities of non-human animals to use language and, more broadly, engage in symbolic thought, have ebbed and flowed in recent decades, but the latest research suggests that humans have underestimated the abilities of canines and other animals such as orangutans, parrots, and dolphins (Morell, 2008). Some dogs have learned to understand hundreds of words, and recent research suggests that they may engage in other types of symbolic cognition such as connecting an object to its two-dimensional picture (Morell, 2008). A series of studies (Hare, Brown, Williamson, & Tomasello, 2002), found that dogs were superior to chimpanzees (our closest existing relative biologically) and wolves in reading nonverbal human cues. In these studies, humans pointed to, tapped, or gazed at the location of hidden food; even puppies (but not wolf pups) were relatively successful at decoding these human behaviors, suggesting that this ability is not the result of learning but the result of the evolution of dogs living with humans. Thus, it appears that dogs are able to communicate with humans on a level that even humans' closest relatives (i.e., chimpanzees) cannot.

The domesticated cat (*Felis catus*) also has a storied history with human beings. The modern-day house cat descends from *Felis silvestris lybica* in the Far East. The development of agriculture is thought to have spurred the relationship between cats and humans; cats eradicated vermin from grain storage, and humans, in return, provided basic shelter and food (Driscoll et al., 2007). A recent archeological excursion uncovered 9,500 year-old cat remains buried with human remains on the island of Cyprus (Vigne, Guilaine, Debue, Haye, & Gérard, 2004). In addition, the ancient Egyptian culture had a high reverence toward cats, and even had gods (e.g., Bastet) that took feline form. Cats were considered to be intelligent but mysterious, and thus were treated with wonder and respect.

SIGNIFICANCE OF ANIMAL COMPANIONS TO HUMANS

The rich history between humans and dogs or cats helps to explain the lavish interdependence that can occur between humans and animals today. The American Pet Products Manufacturers Association (APPMA) reports in the 2007-2008 National Pet Owners Survey that 63% of U.S. households include a pet. It is estimated that in 2008, the total U.S. expenditures within the pet industry will exceed \$43.3 billion, nearly double the 1998 figure. It may be the case that more people own pets, but it also appears that individuals are spending increasing amounts of time and money on their pets. Many types of brand-name or luxury pet products and services have been developed and marketed in recent years, including products analogous to those for humans. Companies such as Paul Mitchell and Omaha Steaks are marketing new designer pet products, such as dog shampoo and gourmet steak dog treats (APPMA, 2007), and massage, acupuncture, and yoga for pets are now readily available. Many hotel chains have adopted increasingly pet-friendly policies, and insurance companies offer accident and life insurance for pets. As of 2007, 39 states allow for the establishment of trusts to take care of pets in case of the owner's or guardian's death (Bennett, 2007). Some owners also spend vast sums of money on ceremonies to celebrate milestones such as pet birthdays and pet weddings, complete with wedding outfits, cakes, and (human) officiants. State courts have recognized that animals represent far more than mere possessions. In two notable cases, owners have been awarded upwards of \$30,000 when their pets were deemed to have been killed wrongfully (Tanick, 1998).

In short, pets are ubiquitous. Individuals go to great lengths to care for them, and illustrate their deep attachment by traveling with them, celebrating milestones with them, and (as we will revisit later) mourning their loss. Psychologists appear to have underestimated the similarities to interpersonal relationships, but they also largely have ignored characteristics of human-animal relationships that are unique. Such characteristics may provide new insights into human psychology.

HUMAN-ANIMAL RELATIONSHIPS AND PSYCHOLOGICAL INQUIRY

Unique facets of the human-animal relationship might provide elegant and compelling tests of traditional psychological theory. We will summarize a few ways in which the development and maintenance of interpersonal relationships differs from human-animal relationships.

Risk of Rejection

One critical issue is that the decision to acquire an animal companion can be a unilateral choice, whereas the choice of a romantic partner or friend is almost inevitably a mutual one. This issue is most clearly revealed in unrequited love, where a suitor experiences love for someone who does not love in return (Baumeister, Wotman, & Stillwell, 1993). Although interpersonal rejection commonly is associated with romantic relationships, social exclusion also occurs between friends and acquaintances and has powerful psychological consequences,

including aggressive and self-defeating behaviors (Twenge, Baumeister, Tice, & Stucke, 2001; Twenge, Catanese, & Baumeister, 2002). Some individuals may hesitate to initiate friendship or romantic relationships due to fear of rejection, but when it comes to relationships with animals, individuals experience virtually no risk of partner rejection.

Fear of Evaluation

A related aspect of human-animal relationships is the reduced fear of evaluation. According to George Eliot, "we long for an affection altogether ignorant of our faults. Heaven has accorded this to us in the uncritical canine attachment." There are many implications for this reduced fear of evaluation by an animal companion. For example, owning a pet could be particularly beneficial for the socially anxious. Social anxiety is the distress felt when one perceives that she will be negatively evaluated by another person (Fenigstein, Scheier, & Buss, 1975; Leary, 1983), and is associated with hypersensitivity to social situations and presenting oneself as non-confrontational (Schlenker & Leary, 1985). Social anxiety, loneliness, and feeling that one has poor social skills often co-occur (Bruch, Kafowitz, & Pearl, 1988; Solano & Koester, 1989). Companion animals may provide the socially anxious with relatively non-evaluative and therefore non-threatening social interaction experiences both at relationship initiation and during relationship maintenance. The socially anxious person's fears of possessing poor social skills are unlikely to be activated in interactions with animals. The presence of an animal companion may reduce feelings of loneliness in some circumstances (e.g., Banks & Banks, 2005, but see Gilbey, McNicholas, & Collis, 2007). Having a pet may even increase one's confidence in social interactions with other people, including but not limited to opportunities to meet likeminded individuals via one's pet (such as behavioral training classes or pet playdates), situations that also may be relatively less threatening since the focus often is on the animals.

Choice and the Selection of Partner Characteristics

Humans have an unprecedented amount of choice in choosing whether to obtain a pet and the corresponding nature of that animal companion. The process of selecting pets may be limited by individuals' living arrangements or finances. Nevertheless, the choice of a pet is a relatively unconstrained, particularly when compared to mutually negotiated human relationships. Mail-order brides notwithstanding, one cannot simply unilaterally choose to enter into a romantic relationship, but one can wake up intending to initiate a relationship with a pet, go to a shelter or pet store, and begin a close relationship that very day.

Moreover, individuals can choose the species that they prefer based on the amount of care required, and can even choose the specific characteristics they desire in an animal companion. In fact, some animals, particularly different breeds of dog, have been bred selectively to possess certain temperaments and characteristics. Thus, animals generally are more predictable than humans (Leary et al., 1994). Animals (even cats) do not plot how to put their best paw forward, selectively disclose information, or engage in outright deception in order to be viewed more favorably. A relationship with a pet is "what you see is what you get" relative to the unpredictability of a human relationship.

In summary, companion animals offer qualitatively different types of supportive relationships, especially compared to romantic relationships, by providing a great deal of choice in a relatively non-evaluative context. We revisit these and other aspects of human-animal relationships in the context of attachment theory.

ATTACHMENT THEORY AND THE HUMAN-ANIMAL RELATIONSHIP

Introduction to Attachment Theory

Attachment theory describes interlocking behavioral systems centered on the formation of close interpersonal bonds. Bowlby (1969; 1980) asserted that the attachment system evolved due to prolonged helplessness on the part of human offspring. Behaviors such as the crying of infants serve to maintain or increase proximity between infant and caregiver. Infants and children use their caregivers as a *safe haven*, where they can seek refuge and support when afraid. Caregivers also serve as a *secure base* from which children can explore their environments. Ainsworth and colleagues (e.g., Ainsworth, Blehar, Waters, & Wall, 1978) employed the "Strange Situation," a laboratory procedure in which children and caregivers experience separation and reunion, to systematically test some of the tenets of Bowlby's theory. They identified specific ways in which children reacted to the reappearance of their mother, which led to theory and research on different attachment styles.

Ainsworth and colleagues (1978) found three primary attachment styles based on her Strange Situation research: secure, anxious-ambivalent, and avoidant. A secure style presumably develops when the caregiver is consistently responsive and affectionate. Secure individuals are comfortable with closeness, and approach relationships with confidence and trust. An anxious-ambivalent style presumably develops when the caregiver is inconsistently responsive. The unpredictability leads anxious-ambivalent individuals to be more uncertain of and preoccupied with the status of their relationships. An avoidant attachment style presumably develops when the caregiver is cool and emotionally unresponsive. Avoidant individuals tend to be more emotionally distant, reluctant to express physical expression or emotional need, and more independent.

In recent decades, social psychologists have appropriated the attachment framework to explore issues of intimacy, support seeking, caregiving, and emotion regulation in adult relationships, particularly romantic relationships. Hazan and Shaver (1987) led this expansion of attachment theory, and adapted and validated the secure, anxious-ambivalent, and avoidant styles for adult romantic relationships. Bartholomew and Horowitz (1991) provided a revised but complementary framework by conceptualizing attachment as two dimensions on a positive-negative continuum: view of self and view of others, yielding four different styles. A positive view of both self and others corresponds to Hazan and Shaver's secure attachment. A negative view of self and positive view of others corresponds to Hazan and Shaver's anxious ambivalent attachment, which Bartholomew and Horowitz refer to as preoccupied. The Hazan and Shaver avoidant category describes a negative view of others, but Bartholomew and Horowitz characterize a positive view of self and negative view of others as dismissing-avoidant and a negative view of self and negative view of others as fearful-avoidant.

Subsequent research has proposed moving beyond a typology or style approach, instead characterizing attachment along two dimensions: attachment avoidance and attachment anxiety (Fraley & Waller, 1998). However, the four Bartholomew and Horowitz styles have heuristic value when considered as mapping avoidance and anxiety in two-dimensional space (e.g., low avoidance and high anxiety corresponds to preoccupied attachment; high avoidance and low anxiety corresponds to dismissing-avoidant attachment).

Attachment to Pets

The emotional depth of the human-companion animal bond suggests that attachment theory can be applied to human-animal relationships. Many researchers agree with this informal view (Beck & Madresh, 2008). Moreover, humans frequently treat companion animals similarly to children or domestic partners; attachment theory has demonstrated that it is versatile enough to apply both to parent-child and romantic relationships. However, we mention a few important caveats. First, the word attachment is commonly used by researchers when they are referring to general bonding with animals but does not necessarily refer to Bowlby's attachment theory in particular (Crawford, Worsham, & Swineheart, 2006). Several scales purportedly measure human attachment to pets, but are not based on attachment theory (e.g., the Lexington Attachment to Pets Scale; Johnson, Garrity, & Stallones, 1992). Second, human-pet relationships are inherently unequal: the animal is dependent on its human companion for virtually all of its major needs. (However, it is worth noting that this power differential is characteristic of many interpersonal relationships, from parent-child to supervisor-worker to romantic relationships, where one member of the dyad possesses more control in the relationship.) Third, some debate exists over the quality of attachment to animals. For example, Endenburg (1995) conducted a large survey study in the Netherlands and described the attachment relationships assessed between humans and their animals as "weak," though the strongest attachments were felt to dogs and cats relative to other animals. Indeed, many animals are owned for work-related reasons (e.g., herding) or are otherwise seen as instrumental (e.g., for protection of the home); owners do not necessarily feel psychologically attached to such animals. Put another way, some pet owners consider their pet merely to be their property, whereas others consider their pet to be a valued member of the family deserving of the rights and privileges as such (Carlisle-Frank & Frank, 2006).

Fourth and most important, much of the recent research involving attachment theory and human-animal relationships is theoretically or methodologically problematic. Researchers need to develop or adapt (Beck & Madresh, 2008) more valid measures of attachment to pets and study a wider variety of pet-related behaviors and cognitions. Much of the extant human-pet work is correlational, bringing into question some of the conclusions that may be drawn. Experimental methods often are challenging (e.g., it is difficult to randomly assign people to be cat owners or dog owners), but are essential for advancing our understanding of these relationships. In addition, the research has been limited because its focus primarily has been the influence of pets on humans, rather than the psychology of the human-animal relationship more broadly. An enhanced application of traditional interpersonal relationships theory and methods to the companion animal arena can demonstrate the significance of these relationships and use these unique relationships to further understand people. In short, this research area would benefit from a superior integration of established theory and

methodology. Nevertheless, researchers have begun to explore this profoundly important component of human relationships.

Can Humans be Attached to Animals? What Defines an "Attachment"?

Bowlby (1969) hypothesized that the attachment system is activated automatically by threatening situations. Recent research has found that peers (i.e., close friends and romantic partners) replace parents as serving the functions of *safe haven* (to whom do you turn when you feel vulnerable?), *proximity maintenance* (with whom do you want to spend time?), and *secure base* (whom do you count on to support you when you really need it?), and that separation from close others, particularly romantic partners, is both subjectively distressing (e.g., Fraley & Shaver, 1998) and physiologically arousing (Fraley & Shaver, 1997). These functions may be identified in cognition, emotion, physiology, and behavior (Hazan, Gur-Yaish, & Campa, 2006). The attachment process appears to take time to develop, and these behavioral systems may be transferred from parent to romantic partner or best friend in progressive stages (i.e., proximity seeking followed by safe haven and then secure base; Fraley & Davis, 1997). It takes about six or seven months for infants to direct the various attachment behaviors to a particular caregiver (Ainsworth, Bell, & Stayton, 1973; Bowlby, 1969). Adults appear to take months or years to transfer these systems to their romantic partner (Hazan & Zeifman, 1994). Most types of strong attachment bonds are marked by high degrees of physical contact, though the type of contact varies according to relationship type (e.g., sexuality for romantic partners). In short, attachment relationships are qualitatively different from the relationships between acquaintances and are marked by a particular pattern of cognition, emotion, and behavior.

How might one assess the degree to which humans are attached to animals? The tools of cognitive-social psychologists might be harnessed to test attachment to animals. In a series of lab studies, Mikulincer, Gillath, and Shaver (2002) subliminally primed threat and found that the names of attachment figures were more accessible. Participants first provided several lists of names, including individuals who served attachment functions for them, individuals they were close to but who were not attachment figures, and acquaintances. Participants were presented with a string of letters that was either a word or not, and tasked with deciding as quickly as possible whether the string of letters was a word. Prior to the presentation of the letter string, participants were subliminally exposed to either a threat word (failure, separation) or neutral word (hat). Individuals were quicker to recognize the names of attachment figures after the threat word but not after the neutral word; this difference was not significant for the names of other close persons, acquaintances, unknown persons, or nonwords.

This research also revealed differences in individual attachment style. Those high in anxiety showed heightened accessibility of the names of attachment figures even without the subliminal threat word prime, and individuals high in avoidance appeared to inhibit the activation of attachment figure names when the threat prime word was *separation*. This is consistent with other research (e.g., Simpson, Rholes, & Nelligan, 1992); these investigators brought couples into the lab and told the female member of the couple that she was going to experience an anxiety-provoking experimental procedure, showing her a room filled with psychophysiological equipment. Unbeknownst to them, the couples were filmed while

waiting for this ostensible procedure, and their caregiving and support-seeking behaviors were observed and coded. Securely attached women, relative to anxious or avoidant women, were more likely to seek support and reassurance from their romantic partner when facing a stressful situation.

The paradigm developed by Mikulincer and colleagues (2002) could be modified to test whether individuals form attachment bonds to their pets. Although the variety and distinctiveness of pet names may need to be accounted for, adding pet names to the lists of names provided by participants and engaging in the same lexical decision task would assess whether this heightened accessibility exists for close pets. We suggest that a significant percentage of individuals, those who report a longer and closer relationship with their pets, will identify their pets' names more quickly when exposed to a subliminal threat.

The method employed by Simpson and colleagues (1992) also could be applied to pets, by observing how individuals seek support from their pets during stressful and non-stressful situations (also see following discussion of Allen, Blascovich, Tomaka, & Kelsey, 1991). More broadly, research in the lab or in the field could assess the extent to which individuals perceive their pets as serving proximity maintenance, safe haven, and secure base functions. For example, individual preferences for animal companions when under stress, either in a diary-type study or manipulated directly in the lab, could be investigated. Presumably, these functions, though different in their manifestations from human relationships, should be present in many human-animal relationships. Like human relationships, human-animal companion relationships likely take months or years to develop, and the proximity seeking, safe haven, and secure base functions likely transfer at different stages as they do from parents to peers. Examining individuals who lack a primary human attachment (e.g., single adults living alone but with a pet) would be a particularly interesting test of these processes.

The strong attachment that many humans form with their companion animals is revealed in the bereavement that humans endure after losing their non-human friends (Hunt & Padilla, 2006). The significance of losing an animal companion has been characterized as "disenfranchised," meaning that the depth of this loss is underestimated and social support often is lacking (Stewart, Thrush, & Paulus, 1989), but scholars have observed a significant animal-related bereavement process. Over half of participants in one study reported believing in an afterlife for their deceased pet (Davis, Irwin, Richardson, & O'Brien-Malone, 2003). One researcher has developed a social work bereavement model based on traditional human grief therapy, but specifically designed for animal loss (Turner, 2003). Attachment theory should be harnessed to further research pertaining to pet bereavement; reactions to the death of a spouse as well as the death of a pet proceed through similar stages as the distress of separation from an attachment figure: protest, despair, and detachment (Parks, 1972). In short, some evidence for the viability of the notion that humans may be as attached to their pets as they are to humans is manifest in similar and profound emotional reaction to their loss.

Safe Haven, Caregiving, and Support Seeking

Many safe haven and secure base functions of the attachment system may be subsumed under the notion of caregiving (Feeney & Collins, 2006); a caregiver provides felt security. Caregivers typically regulate their behavior in response to the needs and expressions of infants. Cries of hunger and cries of pain elicit different responses by parents to restore

closeness and meet the infant's needs. However, attachment style differences exist regarding how effectively the caregiver notices and interprets the needs of the infant, and the extent to which the caregiver appropriately regulates behavior.

More distressing events elicit a stronger desire to restore proximity to an attachment figure (e.g., people often seek physical contact with a romantic partner or parent when distressed or ill). Unfortunately, individuals often give the type of support that they themselves have received (e.g., abused individuals often are insensitive to the needs of others). Avoidant individuals are more likely to use indirect support-seeking strategies, which often lead to unhelpful forms of support (Collins & Feeney, 2004). Avoidant men overall provide less support and are more insensitive to their partners' needs, failing to regulate the amount of support given as a function of distress that the partner feels. There is some evidence that the more stressful the situation, the less support provided by avoidant men to their partners, the opposite of the pattern typically desired by their partners (Simpson et al., 1992). Avoidant individuals are less likely to provide the physical proximity and contact that their distressed partners desire. Research on the relationship between avoidant individuals and their animal companions could further reveal the dimensions and causes of this pattern of support giving. Do avoidant individuals turn to their pets when stressed? Are they more likely to engage in physical contact with animals but not human romantic partners in such circumstances? Do they provide comfort to their distressed animal companions better than they do to their distressed human companions?

Anxious individuals provide less effective support and exhibit more compulsive or overinvolved caregiving (Kunce & Shaver, 1994). That is, the care they offer may be more focused on their own needs (and their perceptions of non-fulfillment) and not well coordinated with their partners' preferences. We suspect that compulsive caregiving by anxious individuals extends to treatment of pets. This may lead to animals that are unruly and poorly trained. We also suspect that patterns of support-seeking directed at pets might differ from the pattern directed at humans by anxious individuals.

Feeney and Collins (2006) took attachment-related support-seeking and caregiving research a step further by investigating motivations for caregiving. Avoidant caregivers are more likely to help their partners for selfish reasons, such as feeling a sense of obligation or assuming that the help will be reciprocated later. Anxious caregivers show a mixture of these motivations and more selfless motivations, including concern for their partners and intrinsic enjoyment of helping their loved ones. Secure individuals appear to be motivated more by love and concern for their partners. Thus, these different motivations suggest reasons why insecurely attached (i.e., avoidant or anxious) individuals provide less effective support or more compulsive support. The motivations for caregiving potentially could be assessed even more powerfully by comparing motivations for the selection of different animals as pets, such as by modifying Kunce and Shaver's (1994) adult caregiving questionnaire. Such research also would have implications for animal welfare (e.g., if there is a link between owner attachment style and pets that are overfed or more likely to develop separation anxiety).

Secure Base and Exploration

Exploration is a fundamental need that is active when the attachment system is quiescent. Bowlby (1969, 1988) discussed the notion of the secure base as a central one in attachment theory. Infants and children use their primary caregivers as launching pads from which to explore. As they get older, children typically operate in ever-increasing orbits around their caregivers. The attachment and exploration systems are connected because exploration potentially exposes explorers to dangers as they increase distance from caregivers. When the threat of danger is perceived, the attachment system is activated and individuals seek to re-establish greater proximity to attachment figures.

Research on exploration and especially the concept of the secure base have been virtually ignored by researchers. One of the few direct investigations of the secure base found that when individuals felt that they had a reliable secure base in their partners (i.e., their partners were sensitive to their needs when they were stressed), they felt that their goals were more attainable and had higher goal-related self-efficacy (Feeney, 2003).

Mikulincer (1997) found that curiosity or information search, a cognitive precursor to exploration, was greater for secure individuals relative to avoidant individuals, and that secure individuals also had reduced need for cognitive closure relative to anxious and avoidant individuals. Hazan and Shaver (1990) operationalized exploration as orientation to work, and found that secure individuals were more confident about work, enjoyed work for its own sake, and were not preoccupied by fears of failure. Anxious individuals, in contrast, feared negative evaluation and appeared to be motivated to gain the approval of others. Avoidant individuals often used work to replace social interactions.

Elliot and Reis (2003) identified a link between attachment and exploration-related motivation, specifically effectance motivation—the desire to have successful interactions with one's environment. Effectance motivation, and the desire for exploration in general, should be a default motivation unless other motives temporarily establish primacy (e.g., individuals who believe that their safety is threatened will cease exploring their environment). Anxiously attached individuals, for example, may therefore have chronic interference with exploration-based motivation because they feel threatened (Elliot & Reis, 2003; White, 1959). Elliot and Reis found that secure attachment was associated with a high need for achievement (and a low fear of failure) in academic settings. Security also was associated with more approach goals (how can I get better at this?) than avoidance goals (how do I prevent failing?).

Green and Campbell (2000) developed an index to measure exploration in the social (e.g., meet new people), intellectual (e.g., visit a modern art museum), and environmental (e.g., travel overseas) domains, and found that attachment avoidance and anxiety both were negatively correlated with exploration. That is, less anxiety and greater comfort with closeness correlated with the desire to engage in activities such as joining a new social group, visiting a strange place, or thinking about unusual ideas. A second study activated one of the three attachment relational schemas (cf. Baldwin, 1992; Baldwin, Carrel, & Lopez, 1990) to assess experimentally the link between attachment and adult exploration. Individuals were primed with a secure, anxious, or avoidant relational schema via an ostensible sentence memorization task in which key words in the sentences related to attachment constructs (e.g., dependence, unpredictability, trust, disclosure, uncertainty). Individuals primed with one of the two insecure styles were less interested in exploration and expressed reduced preference

for novel stimuli (e.g., unusual Escher prints such as a dragon biting its own tail) relative to those primed with the secure style.

Future research could investigate how couples affect each other's exploration. Perhaps securely attached couples foster more exploration as each partner serves as a secure base for the other from which to try new activities. In a similar vein, animal companions might provide the emotional resources (i.e., the secure base) for an individual to engage in greater social or environmental exploration, or even change an owner's dispositional levels of anxiety or avoidance, preparing him or her for more secure human relationships. Perhaps simply having a pet might open the door to pet-related activities that facilitate the development of human relationships (e.g., volunteering at the ASPCA, online chats with fellow cat lovers).

On the other hand, some types of exploration might be inhibited by the attachment to an animal companion. For example, Mikulincer (1997) found that avoidant individuals read more about consumer products (i.e., acted more curious) when that choice competed with social interaction. That is, avoidant individuals may choose a less threatening relationship with a pet over a human relationship. In addition to possible moderation by attachment anxiety or avoidance, the type of animal companion or the quality of the human-animal relationship might moderate this relationship. In short, examining exploration from the perspective of pet-human relationships may provide valuable insights about human attachments and exploration in various domains.

Pet Choice and Attachment Style

A great deal of social psychological theory has addressed how individuals choose their friends and romantic partners, and these concepts may be applied to research on choosing pets. Attachment theory provides a particularly fascinating approach to this issue. Research suggests that the pairing of individuals according to attachment style is not random. Some research has found that individuals are most attracted to those who share their attachment style (Frazier, Byer, Fischer, Wright, & DeBord, 1996). However, these preferences may not become reality. Kirkpatrick and Davis (1994) found no avoidant-avoidant or anxious-anxious pairs in a sample of 354 heterosexual dating couples. They also found that couples composed of an avoidant man and an anxious woman were fairly stable over three years, in spite of the fact that these relationships were relatively unhappy. It may be that individuals find themselves with partners who confirm their (often negative) attachment-related expectations (e.g., an avoidant man expects his partner to be clingy and demanding, which characterizes anxious-ambivalence).

What is the relevance of this research for human-animal pairings? First, do humans view different pets along attachment-related dimensions? We have obtained suggestive evidence that they do. We asked individuals to provide open-ended descriptions of dogs and cats, and used content analysis to examine the attachment-related words. Dogs were described with more security-related words, whereas cats were described with more avoidance-related words. (These results were not qualified by individual levels of avoidance and anxiety—similar perceptions of cats and dogs existed for everyone.) These findings were replicated when we adapted the Experiences in Close Relationships (ECR-R) scales (Fraley, Waller, & Brennan, 2000; Sibley, Fischer, & Liu, 2005), the most commonly used and validated measure of attachment avoidance and anxiety, to dogs and cats separately. That is, we asked individuals

to imagine owning a particular animal and to report how they would feel in the context of a relationship with that animal ("it is easy for me to be affectionate with my dog").

If dogs and cats are perceived to vary along attachment-related dimensions, does their desirability as pets depend in part on the level of avoidance or anxiety of potential owners? We collected some preliminary data on this question as well. Not surprisingly, the more avoidant individuals reported themselves to be, the less interested they were in owning a pet. The more anxious individuals reported themselves to be, the more interested they were in wanting to own a pet. However, findings for specific animals varied somewhat: anxiety was positively correlated with wanting to own a cat, but not correlated with wanting to own a dog. Our tentative conclusion is therefore consistent with the Kirkpatrick and Davis (1994) findings and their interpretation of attachment pairing: individuals may end up choosing a pet that confirms their expectations (e.g., an anxious person is more likely to choose a cat, who is perceived to be relatively avoidant). More direct research is needed to assess if attachment avoidance and anxiety predict the type of pet that individuals actually choose.

Do Attachment Styles Change?

Another fascinating theoretical question involves the malleability of attachment styles or dimensions. Attachment usually is conceptualized as a stable individual difference developed during childhood as a result of the pattern of behavior by one's primary caregiver. Reports of the stability of attachment styles have varied widely in the literature, but the best conclusion at this time is that these styles are only moderately stable over the long-term (Fraley, 2002).

Individuals likely have different attachment styles with different individuals (Kamenov & Jelic, 2005). Put another way, individuals have schemas or working models of different attachment styles in memory. Even though there likely is a primary (or chronically activated) style, the other styles can be activated under different circumstances or in different relationships (Green & Campbell, 2000). For example, one may feel securely attached to many friends, but feel anxious when considering a particular friend who rarely returns calls. Attachment stability is affected by the beginning or ending of a romantic relationship (Kirkpatrick & Hazan, 1994) and non-romantic relationships (i.e., those with family members and friends) tend to be more secure than romantic relationships (Kamenov & Jelic, 2005).

When we directly compared individuals' attachment anxiety and avoidance (as assessed by the ECR-R) with their reports on the same measure adapted for different animals, we found that individuals reported significantly more attachment security to dogs than to people (with cats falling in between). Similar results of strongly felt security associated with pets were recently reported by Beck and Madresh (2008), supporting our previous contention that human-pet relationships are characterized by reduced evaluation concerns. Research shows that experiences with family members, friends, and romantic partners may buffer and possibly even alter attachment anxiety and avoidance; however, whether pets may help individuals change on attachment dimensions (i.e., become less avoidant or less anxious) is a currently unaddressed but fascinating question. That is, will the felt security from a long-term relationship with a pet change one's predominant attachment style from an insecure to a secure one? If so, how might that affect the individual's human relationships? In summary, attachment anxiety and avoidance can be measured at the general level or at the partner-specific level. Relationships with many animals may be associated with less anxiety than

relationships with humans. Future research should investigate whether pet-human relationships affect more general attachment orientations, and thus possibly affect future human relationships.

More broadly, research on both humans and animals as third parties to dyadic relationships is needed (Green, Burnette, & Davis, 2008), because third parties can profoundly influence those relationships. This area is woefully underresearched, in part due to methodological and statistical challenges. Balance theory (Heider, 1958) provides a particularly useful framework for investigating the role of third parties in dyadic relationships. Being overly attached to one's pet (one's first love?) may have deleterious consequences for a romantic relationship if the partner feels he or she is competing against the pet. Stambach and Turner (1999) found that attachment to cats correlated negatively with the number of close others who provided social support. On the other hand, as mentioned previously, pets may provide a secure base or buffer for some individuals, or provide a training ground for learning caregiving and support-seeking, leading to better human relationships longer-term.

COMPANION ANIMALS AND HEALTH

Physical Contact, Ownership, and Health

Attachment theory can also be seen in the considerable literature (of which we discuss only representative examples) investigating the influence of animals on human well-being. Such research generally has found that companion animals improve physical and mental well-being for human owners (Crawford, Worsham, & Swinehart, 2006). Proximity to a variety of pets (e.g., watching aquarium fish; Katcher, Segal, & Beck, 1984) or petting an animal (even snakes, Eddy, 1996) can reduce blood pressure or heart rate, although the evidence is somewhat mixed. Other work has confirmed that touching pets can attenuate cardiovascular responses (Vormbrock & Grossberg, 1988), but some research has found no significant benefits or even come to the opposite conclusion (i.e., raised physiological markers in the presence of an animal). However, some of these studies have used unfamiliar animals, highlighting the differences between the potential calming presence of any animal and the unique bond with one's own animal.

The attachment system is activated under stressful conditions, so attachment-related concerns will be more pronounced in stressful situations than in non-stressful situations. Though they did not assess attachment style, which may have qualified their results, Allen and colleagues (1991) had female dog owners perform a stressful mental arithmetic task in the lab as well as at home. Autonomic responses (e.g., skin conductance, pulse rate) were assessed on both occasions. Participants completed the task at home either alone (only the experimenter present), with their dog present (but no touching of the pet occurred), or with a close friend. Compared to the alone condition, participants had significantly less physiological reactivity when their pets were present, but more reactivity when their friends were present. Participants apparently were concerned about being evaluated by their friends even though the friends intended to be supportive; participants tried to perform the arithmetic tasks more quickly but made more errors when their friends were present. The dogs in this

case appear to have provided non-evaluative social support, consistent with our previous assumptions.

These more controlled experiments are complemented by research focusing on the influence of animals on longer-term physical and psychological health. Research confirms that companion animals usually provide health benefits, though this evidence is also sometimes conflicting (for reviews see Podberscek, Paul, & Serpell, 2000; Wilson & Turner, 1998). For example, a longitudinal study demonstrated that individuals who had recently acquired pets, as opposed to non-pet owners, showed significant decreases in the number of subsequent physician visits (Headey & Grabka, 2007). Researchers found lower rates of depression among humans highly attached to their pets (Garrity et al., 1989). The limitations of correlational research are particularly noteworthy in these situations. It is possible that the presence of a pet reduces depressive symptoms, but it is also possible that non-depressed individuals are more likely to seek out a pet for companionship, and that additional variables may moderate this association.

Special Populations

Much of the companion animal and health research has focused on special populations such as the elderly, likely due to potential increases in loneliness and health-related issues associated with this demographic group (Siegel, 1990; Tucker, Friedman, Tsai, & Martin, 1995). Elderly animal owners, relative to non-owners, showed less deterioration in general health (Raina, Waltner-Toews, Bonnett, Woodward, & Abernathy, 1999), engaged in healthier behaviors such as exercise and diet (Dembrecki & Anderson, 1996), and had significantly fewer visits to the doctor (Siegel, 1990). However, the influence of companion animals on elderly health has not been entirely consistent (Parslow, Jorm, Christensen, Rodgers, & Jacomb, 2005; Siegel, 1990) likely due to the considerable methodological challenges associated with studying pet ownership in this population (Pachana, Ford, Andrew, & Dobson, 2005).

Another special population that has received attention is individuals recovering from serious illness. For example, dog ownership (but not cat ownership) was associated with a higher survival rate from heart episodes over one year (Friedman & Thomas, 1995). A parallel study examined the role of pet ownership in lung transplant recipients (Irani, Mahler, Goetzmann, Russi, & Boehler, 2005). Lung transplant recipients who owned pets showed subsequently greater quality of life but no significant physical health differences when compared to lung-transplant recipients who did not own pets. The absence of any significant health differences is compelling when considering that health centers sometimes warn against pets because of the possibility for zoonotic disease transmission. At least in this intriguing study, any physical health-related risks associated with having pets appear to be negligible or offset by the psychological boosts associated with owning a pet.

The influence of pets on human health dovetails nicely with growing utilization of animals in pet-facilitated therapy. Pet-facilitated therapy (PFT) refers to the use of animals as catalysts in several forms of therapeutic intervention (Brodie & Biley, 1999; Hines & Fredrickson, 1998). "Therapy" in this context may carry some degree of ambiguity; it often is unclear whether PFTs are tied to a specific therapeutic goal or the more general goals of personal development and well-being. To illustrate the former, Levinson (1969), in a seminal

paper, had his dog (described as a co-therapist) attend therapy sessions with child psychiatric patients and found that withdrawn children often opened up after interacting with the dog. To illustrate more general well-being or skill goals, pets have been used to facilitate reading development in children: the presence of a pet helped children increase their reading skill and their confidence in reading (Philips, 2006). The most common applications of PFT involve elderly populations who frequently lack social support (Hooker, Freeman & Stewart, 2002) or children and adults with clinical or related disorders. For example, PFT has been utilized for hospitalized children (Kaminski, Pellino, & Wish, 2002), autistic children (Prothmann et al., 2005; Redefier & Goodman, 1989), children with eating and anxiety disorders (Prothmann et al., 2005), and adult incarcerated felons (Moneymaker & Strimple, 1991). The fact that animals can assist in the recovery or increased well-being of individuals with a variety of physical or psychological problems provides further evidence that the human-animal bond can be a close and vital one.

Explanations for Health Benefits: Direct and Indirect Effects

Several explanations have been proffered for why animals confer health benefits to their human companions. One obvious direct effect involves the affection that individuals receive from pets and the fact that individuals can affiliate with pets during stressful times (Collis & McNicholas, 1998). In addition, some researchers have investigated the idea that animals provide humans with greater meaning or purpose because they are responsible for the care of their pets (e.g., Collis & McNicholas, 1998). One indirect explanation for the association between pet ownership and health is that companion animals can increase social support by facilitating interactions between humans (e.g., Chinner & Dalziel, 1991). Another indirect explanation is that pet owners may exhibit increased physical activity, such as dog owners going for walks more often than non-dog owners.

Connections to Attachment Theory

Much less work has approached these questions from an attachment theory (or other theoretical) perspective. Indirectly related to attachment theory and its emphasis on close emotional bonds, unmarried dog owners who reported feeling close to their pet had fewer doctor visits than unmarried dog owners who reported not feeling close to their pet, as well as fewer doctor visits than unmarried non-owners (Headey, 1999). Colby and Sherman (2002) incorporated attachment style directly into an examination of pet visitation and subjective well-being in an institutionalized elderly population. They demonstrated that attachment styles play an important role in the effectiveness of pet visitation; whereas individuals with secure or anxious/ambivalent attachment styles responded positively to dog visitation, those with avoidant attachment styles responded negatively. This pattern is consistent with research on humans. Carpenter and Kirkpatrick (1996) found the following attachment style differences regarding stress and physiological reactivity: Securely attached women did not show different reactivity to a psychological stressor when alone than when with their romantic partner, but avoidant women showed higher blood pressure when their partner was with them compared to when they were by themselves. As queried previously, do avoidant

individuals inhibit contact with pets when highly stressed, or is the lack of evaluation going to make them just as likely to turn to a pet, rather than a human, for comfort?

In summary, the majority of research suggests that companion animals provide physical and psychological health benefits. Nevertheless, researchers should continue to incorporate attachment theory and other relationship theories and methods to investigate the connection between animals and health.

SUMMARY

One of the most popular textbooks on the psychology of interpersonal relations (Berscheid & Regan, 2005) includes a section on "relationships with companion animals." This brief synopsis includes wonderful anecdotes about the bonds between individuals and animals as well as examples in which an animal beloved by one person increases the stress felt by that person's spouse. However, no scientific research is cited, which emphasizes (a) the poor integration of the human-animal relationship into the broader notion of "interpersonal relationships" and (b) the opportunity for additional research. We hope that our selective review of the relevant literature helps spur researchers to venture into these largely uncharted waters, so that future textbooks on relationships have a surfeit of sources from which to draw. We have touched on only a few of the myriad applications to both human and animal welfare.

Bowlby's attachment theory and his insights about human emotional bonds were in part inspired by research on animals, including the Harlow studies (e.g., Harlow, 1958) of rhesus monkey babies who attached to artificial cloth mothers that did not provide milk over wire mothers that provided milk (highlighting the importance of physical touch in an emotional bond), as well as animal imprinting studies that demonstrated the tendency of many baby animals such as goslings to follow the first animal they see after they are born or hatched. Therefore, it is gratifying to see that attachment theory may come full circle and be fruitfully applied to relationships between humans and their animal companions. We deliberately focused on this one theoretical perspective, but other theories of human relationships also may be applied to relationships between humans and animal companions. For example, interdependence theory (Kelley & Thibaut, 1978; Rusbult & Arriaga, 2000) may help to illuminate issues of power and dependence and the variety of interdependent situations in which humans and animals find themselves enmeshed.

As psychologists and pet owners, we are excited about what the future holds for research on human-animal relationships. These close relationships are worthy of study in their right, but we also are confident that a theoretically and methodologically rigorous approach to studying them will expand our understanding of interpersonal human bonds.

ACKNOWLEDGEMENTS

We thank Jeni Burnette, Jennifer Clarke, and Jody Davis and for their constructive feedback on earlier drafts. We also thank our beloved pets Indy, Maggie, Mini, Durango, Jupiter, and Emily for their inspiration and support during this project. Correspondence

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