

‘Thriving Through Relationships’ as a useful adjunct to existing theoretical frameworks used in human-companion dog interaction literature

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The relationship formed between a human and a dog can be transformative. Human-Animal Interaction (HAI) research aims to understand why these relationships are so important. Within this field, human-dog relationships have been explained through various theoretical constructs, of which the ‘biophilia hypothesis’, ‘attachment theory’ and ‘social support’ are the most common. However, none of these constructs completely explain the benefits that human-dog relationships can provide. In this paper, a new theory, the Thriving Through Relationships (TTR) theory, is applied to human-dog relationships, in order to ascertain its capacity to further explain the benefits that dogs can provide to humans. The TTR theory proposes mechanisms for immediate and long-term indicators of thriving, which may add new insight into how human-dog relationships are beneficial. Multiple dimensions of thriving are used to explain how a supportive other could assist an individual to thrive, both in the face of adversity and during times of relative normalcy. The TTR theory may, therefore, enhance understanding of the transformative potential of human-dog relationships.

Keywords: social support, attachment theory, biophilia hypothesis, service dog, assistance dog

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Humans and animals interact with each other in an interconnected world in which some human-animal relationships are prioritized. This is the case for all domesticated animals, including dogs. Dogs have the privilege of sharing human homes and are often viewed as ‘members of the family’ (S. P. Cohen, 2002; Modlin, 2008). According to existing research in the field of human-animal interactions (HAI), this relationship can provide many benefits to humans, including decreased anxiety (Burrows, Adams, & Spiers, 2008; Butterly,

Percy, & Ward, 2013; Kirton, Winter, Wirrell, & Snead, 2008; Valentine, Kiddoo, & LaFleur, 1993), and increased companionship (Putney, 2014; Rew, 2000) and sociability (Brooks, Rushton, Walker, Lovell, & Rogers, 2016; S. Ryan & Ziebland, 2015).

While the benefits provided by companion dogs are widely accepted (Barker & Wolen, 2008; Friedman & Krause-Parello, 2018), the theoretical frameworks for understanding how dogs provide these benefits merit closer attention. One approach

that has been pursued in HAI research is to apply various constructs, including human-human relationship theories to human-dog relationships. Though there is no single theory that underpins this approach (O'Haire, 2010; Wright, 2018), three theoretical constructs, predominate in the field: the biophilia hypothesis, attachment theory and social support (Amiot & Bastian, 2015; O'Haire, 2010). While these constructs have been applied to various human-animal relationships, in reviews of companion animal studies the human-companion dog relationship is most commonly discussed (Barker & Wolen, 2008; Friedmann & Son, 2009) and therefore deserves specific attention. However, it is recognized that these theories potentially apply to other human-animal relationships as well.

The purpose of this paper is to examine how these three constructs have been used in dog related HAI research and to introduce a new theory, the Thriving Through Relationships (TTR) theory. This theory has not previously been applied in HAI research, but it might be useful as an adjunct framework for human-dog research. We outline the TTR theory and examine how specific elements of this theory might help to provide an enhanced understanding of human-dog relationships.

Common constructs applied to human-dog relationships

Biophilia hypothesis

“Biophilia” means love of life or living systems (“Biophilia,” 2012). As described by Wilson (1984), humans express “biophilic tendencies” through actions such as seeking connection with nature, or with other living things. The biophilia hypothesis, which was first proposed by Wilson, and further expanded by Kellert (Kellert, Heerwagen, & Mador, 2011), suggests that these tendencies are innate, especially with animals, because they are adaptive in an evolutionary sense.

The biophilia hypothesis is useful to HAI research because of the observation that humans’ attraction to animals (as elements of ‘nature’) is stronger than to inanimate objects in the environment (LoBue, Bloom Pickard, Sherman, Axford, & DeLoache, 2013). Within the HAI literature, the biophilia hypothesis is often applied to human-dog relationships (Cutt, Giles-Corti, Knuiman, & Burke, 2007; Serpell, 1996), as well as to the specific positive effects of these relationships (Kruger & Serpell, 2006). However, the theory sits within a contested nature/nurture debate about whether human feelings towards nature are innate, or learned (Kahn, 1997; Serpell, 2004) and developed (Garrett, 2007). Often, the learned, ‘nurture’ argument for biophilia outweighs the ‘nature’ one (Wright, 2018). This contestation is significant to the HAI context because, in HAI literature as well as in more generalist writing, humans are often described as expressing biophilic tendencies toward dogs *because of* our collective interspecies evolutionary history (Wang et al., 2013). Meanwhile, peoples’ fear of dogs is often described as *stemming from* learned experiences (Doogan & Thomas, 1992). Typically, neither of these assertions is entirely amenable to empirical verification.

The biophilia hypothesis framework lacks measurement tools or evaluative processes for measuring or understanding the putative effects of animals on humans, and this has led influential researchers to dismiss instinctive affiliation or attraction to animals as a verifiable factor in human-dog interactions (Herzog, 2002; Kruger & Serpell, 2006). Thus, while the biophilia hypothesis can provide a basis for understanding the psychological and emotional satisfaction that a person can receive from interacting with any living thing (Wright, 2018), it cannot provide any deeper insight into the specifics of HAI. As Joye and De Block (2011) note, practically any

interaction with nature can be made to fit the hypothesis. Meanwhile, Feeney has gone so far as to dismiss the biophilia hypothesis as an ‘abstraction’ in relation to the human-animal bond (P. Feeney, 2010). In light of these contributions, it seems clear that biophilia has only limited capacity to illuminate the deeper complexities of human-dog interactions.

Attachment theory

Attachment theory, originally proposed by Bowlby (1982), is a concept from the field of developmental psychology that considers the importance of the bond(s) formed with caregiver(s) in infancy. Bowlby proposed that the strength of this bond, or attachment, could be measured through four relationship elements: proximity seeking, safe haven, secure base and separation anxiety (Bowlby, 1982). Strong attachments, formed through supportive relationships, are associated with physical and psychological benefits to individuals (Crawford, Worsham, & Swinehart, 2006). The strength of an attachment relationship is typically demonstrated through species-specific attachment behaviors, whereby a potentially vulnerable individual seeks to maintain proximity to the attachment figure, who is better able to cope with life stressors (Bowlby, 1982).

Attachment theory provides a list of different attachment types. A positive attachment figure should be a sensitive, responsive and consistent caregiver (Field, 2011; Lowenstein, 2010). For secure attachment, the caregiver responds appropriately, promptly and consistently. Conversely, an ‘avoidant’ attachment caregiver provides little response when confronted with distress, and instead encourages independence and exploration. ‘Ambivalent’ attachment caregivers, meanwhile, are inconsistent, and ‘disorganized’ attachment caregivers are often characterized by disoriented behavior,

or negativity and withdrawal (Lowenstein, 2010). An individual can form relationships with various support providers; however, hierarchical preference for caregivers occurs (Field, 2011). This means that when the main attachment figure is not responsive, another attachment figure can be sought (Field, 2011).

In HAI research, attachment theory has been applied to various types of human-dog relationships, including relationships with companion dogs (Mariti, Ricci, Carlone, et al., 2013; Topál, Miklósi, Csányi, & Dóka, 1998), assistance dogs (Fallani, Previde, & Valsecchi, 2006, 2007) and other working dogs (Mariti, Ricci, Carlone, et al., 2013), but with some deviations from the original context. Normally, the theory is used to describe a child’s level of attachment to an adult caregiver (Lowenstein, 2010), however in human-dog studies, attachment has been measured bi-directionally, both as a measure of human attachment to dogs, and as a measure of dog attachment to humans (Amiot & Bastian, 2015). Demonstrating this dual application, first in the context of the owner as ‘caregiver’, owners have been shown to represent a ‘secure base’ and ‘safe haven’ for their dogs (Mariti, Ricci, Zilocchi, & Gazzano, 2013). Meanwhile, dogs have been shown to demonstrate proximity seeking (Fallani et al., 2006, 2007; Mariti, Ricci, Carlone, et al., 2013) and separation anxiety (Mariti, Ricci, Carlone, et al., 2013). Reversing these roles, dogs have also been shown to represent a ‘safe haven’ (Zilcha-Mano, Mikulincer, & Shaver, 2012) and ‘secure base’ for an individual human (Kurdek, 2008; Kwong, 2008; Zilcha-Mano et al., 2012), with the human also demonstrating proximity seeking behavior (Kurdek, 2008) and separation anxiety (Purewal et al., 2017).

The dual character of attachment theory, when applied to human-dog relationships demonstrates that the theory is

adaptable. However, this use of attachment theory, which deviates from the original, specific definition of attachment (Crawford et al., 2006), can lead to research inconsistencies. For example, a defining quality of ‘attachment’ involves the subject being better able to cope with life stressors (Bowlby, 1982). However, this is difficult to determine if the subject is a dog. Also, since many of the HAI studies do not strictly adhere to Bowlby’s original definition of attachment, it is difficult to determine if their measurements reflect an ‘attachment relationship’ as specifically proposed by Bowlby, or some other sort of strong affectional relationship or bond.

HAI research also presents deviations from the original theory that are apparent in behavioral measures adapted from the Ainsworth Strange Situation Task (Topál et al., 1998) and four surveys: Pet Attachment Survey (Holcomb, Williams, & Richards, 1985), Lexington Attachment to Pets Scale (T. P. Johnson, Garrity, & Stallones, 1992), Pet Relationship Scale (Lago, Kafer, Delaney, & Connell, 1988) and Companion Animal Bonding Scale (Poresky, Hendrix, Mosier, & Samuelson, 1987). The scales within these measures have been criticized for lack of congruency to all attachment theory components (Crawford et al., 2006). For example, proximity seeking measurements have been critiqued for measuring a person’s pleasure in physical contact with their dog rather than inquiring about the security experienced during physical contact (Crawford et al., 2006). The Pet Attachment Survey, for example, states “you like to stroke and touch your pet” (Budge, Spicer, Jones, & George, 1998). Elsewhere, two studies using the modified Ainsworth Strange Situation Task have used factor analysis to attempt to identify categories of dog responses during the task. These categories included proximity seeking, playfulness and fearfulness (Fallani et al.,

2006) and anxiety, acceptance and attachment (Topál et al., 1998). These clearly differ when compared to the original categories proposed in attachment theory, although the dog-human relationship was described as an attachment relationship in these publications.

These adaptations and deviations potentially limit the integrity of attachment theory when applied to HAI research, and this is acknowledged in the existing literature. While some studies report that the human-dog relationship can be an attachment relationship (Kruger & Serpell, 2006), others have argued that conclusive evidence for attachment in dog-human relationships is limited (Prato-Previde, Custance, Spiezio, & Sabatini, 2003). In their comprehensive review, Crawford et al. (2006) concluded that humans’ attachment to companion animals is variable and may not provide any substantial effect.

Social support

Social support is a multidimensional construct used broadly to denote social relationships that promote mental and physical health and well-being (S. Cohen, Underwood, & Gottlieb, 2000). It is a somewhat general concept, based on the observed link between health and well-being and socially supportive relationships. Various theories of social support exist, which acknowledge this well-established link. However, the multifarious nature of the social support construct potentially complicates its application to HAI research.

Traditional theories of social support focus on its importance in coping with stress and adverse situations. One example is the ‘stress and coping social support theory’, which employs the ‘buffering’ hypothesis (S. Cohen et al., 2000), where provision of, or access to, social support acts as a buffer to stress, diminishing the effects of stress for people with strong social support (S. Cohen & McKay, 1984). This hypothesis proposes

two time points where a support provider can intervene (S. Cohen & Wills, 1985). The first occurs before the stressful event has been recognized as being stressful. The second occurs after the initial experience of the event but before the onset of a pathological outcome (S. Cohen & Wills, 1985). Another example, the ‘relational regulation theory of social support’, employs the ‘main effects’ hypothesis. This theory states that people with high quality social support are healthier overall and therefore, suffer less from potentially stressful events to begin with (Lakey & Orehek, 2011).

In attempts to make social support more measurable, a typology of support has been created, which includes: emotional (nurturance), companionship (sense of belonging), instrumental (tangible assistance), and informational (advice) support (S. Cohen et al., 2000; Flannery Jr, 1990; B. R. Sarason, Sarason, & Pierce, 1990; I. G. Sarason & Sarason, 1985). Other categories have also been proposed, such as directive guidance, nondirective support, positive social interaction, and tangible assistance (Barrera Jr & Ainlay, 1983). Due to the lack of a unitary theory of social support, and because of the various categories of support proposed, there are variations in terminology and inconsistent definitions in the existing literature. This causes confusion and impacts on the application of social support in HAI research.

Nevertheless, parallels exist between the benefits that supportive human-human relationships and supportive human-dog relationships provide. At the very least, there is broad consensus that dogs can provide health and well-being benefits (Morrison, 2007), the ultimate outcome of social support. While null and negative associations between dog ownership and these outcomes have been reported (Herzog, 2011; McNicholas et al., 2005), positive reports predominate. Moreover, with respect to the

four proposed types of social support described above (i.e. emotional, companionship, instrumental, and informational support), research demonstrates that dogs are able to fulfil each of these dimensions (Burton, 2016; Wright, 2018).

Dogs are frequently reported to provide companionship (Fifield & Forsyth, 1999; Putney, 2014; Rew, 2000; S. Ryan & Ziebland, 2015) and emotional benefits (Andreassen, Stenvold, & Rudmin, 2013; Brooks et al., 2012; Maharaj & Haney, 2014). Some assistance dogs are trained to provide instrumental support as well, such as performing functional tasks for a handler with a disability (Connolly, 2004; Fairman & Huebner, 2001), and some provide informational assistance, such as forewarning a handler of an impending seizure or hypoglycemic episode (Dalziel, Uthman, McGorray, & Reep, 2003; Petry, Wagner, Rash, & Hood, 2015). Similarly, herding dogs (McConnell & Baylis, 1985) and livestock guarding dogs (Andelt & Hopper, 2000) provide instrumental assistance in farming operations, while search and rescue dogs provide informational assistance to their handler in locating individuals (Jones, Dashfield, Downend, & Otto, 2004). Therefore, where dogs are concerned, the definition of social support can potentially include a wide range of effects.

Broadly speaking, HAI researchers are comfortable with the characterization of human-companion dog relationships as instances of social support (Allen & Blascovich, 1996; Beck & Katcher, 2003; Burrows et al., 2008; Lane, McNicholas, & Collis, 1998; McNicholas & Collis, 2000). Numerous studies have shown that benefits of the human-dog relationship parallel those reported from human-human supportive relationships. By proxy, then, it is sometimes assumed that dogs provide social support equivalent to that provided by humans.

However, the same benefits might be underpinned by two different mechanisms, and these remain obscure even in relation to the social support provided by humans. It is sometimes proposed that dogs act indirectly as social supports, facilitating social support by being a social catalyst for their owner to partake in social interactions with other people (Brooks et al., 2016; R. A. Johnson & Gayer, 2008; Maharaj & Haney, 2014). Dogs can also be a confidant within themselves, as people have described dogs to be substitutes for human social interaction (S. Ryan & Ziebland, 2015).

Overall, social support appears to be an effective construct for explaining the benefits reported from human-dog relationships. However, while it has been established that social support results in better health (Kaplan, Cassel, & Gore, 1977), robust explanations for the effects of social support on various health outcomes are difficult to find (Nurullah, 2012). This is further complicated by the indirect application or absence of consideration for social support theories in the methodology of many studies. HAI researchers have not always applied or interpreted social support concepts and definitions faithfully from their original conceptualizations; furthermore, the social support construct is sometimes considered a ‘catch-all’ for various positive social interactions (Burton, 2016), and therefore lacks specific measures of effectiveness.

Extending Social Support: Thriving through Relationships

To fully understand the benefits which can arise from human-dog relationships, we propose moving beyond existing theories to consider possible adjuncts to the theories already widely in use in the intraspecific human relationship literature. One example is the Thriving Through Relationships (TTR) theory of social support: a relatively new theory

proposed by Feeney and Collins in 2012, which focuses on the impact supportive relationships have on a person’s ability to thrive (B. C. Feeney & Collins, 2012, 2014, 2015a, 2015b). This theory draws on other psychological theories, including those described earlier in this paper, but it builds from these constructs to identify specific interpersonal processes which permit relationships to support and promote thriving (B. C. Feeney & Collins, 2015a).

The TTR framework is a theoretical model which holds that thriving - the ability to flourish (grow, develop and prosper) and add value to life, behaviorally, emotionally and cognitively (O’Leary, 1998) - is promoted through support provided by relationships in specific circumstances. Thriving refers to moving beyond a baseline level of functioning, as opposed to surviving (functioning below baseline) or recovering (return to baseline; O’Leary, 1998; O’Leary & Ickovics, 1995). Moving from a state of survival or recovery to thriving does not involve a direct path with an ultimate endpoint. Instead, thriving is conceptualized as an ongoing process of growing and moving forward (Benson & Scales, 2009). This process is dependent on numerous factors, which can be framed as contextual (environmental) or personal (individual) characteristics (Benson & Scales, 2009; Massey, Cameron, Ouellette, & Fine, 1998). When these features align positively, enabling a context-appropriate response to a given situation, a person’s ability to thrive is likely to increase (Benson & Scales, 2009; Lerner, Lerner, von Eye, Bowers, & Lewin-Bizan, 2011; Lerner, von Eye, Lerner, Lewin-Bizan, & Bowers, 2010; Scales, Benson, & Roehlkepartain, 2011; Theokas et al., 2005).

The psychological concept of thriving has been applied to populations such as adolescents (Scales, Benson, Leffert, & Blyth, 2000; Scales et al., 2011) and teachers

(Beltman, Mansfield, & Price, 2011), but has only recently been considered in relation to HAI research (Gravrok, Howell, Bendrups, & Bennett, 2019). In the following text, the TTR theory is applied in the context of dog-owner relationships. We focus on four components of the TTR theory: the life contexts in which an individual can provide support; qualities of support providers; immediate benefits of support; and, long-term benefits of support. Limitations to the TTR theory and further considerations for HAI research are also discussed.

Support in different life contexts

The TTR theory emphasizes two circumstances in which a person may receive support to thrive. The first circumstance occurs when individuals experience some form of adversity in their life, which they may need support to confront and surpass, in order to thrive. This support is called ‘Source of Strength’ (SOS) support. The second life circumstance is where individuals are not facing adversity, such as in a time of relative prosperity, when support can act as a stimulant to enhance their life. This is known as ‘Relational Catalyst’ (RC) support. These two life contexts are considered equally important to thriving (B. C. Feeney & Collins, 2012, 2014, 2015a, 2015b).

The TTR theory builds from both social support and attachment theory in the conceptualization of the life contexts in which an individual may require support, including times of stress and normalcy. In existing human-dog relationship studies that report benefits such as decreasing loneliness (Black, 2012; Guest, Collis, & McNicholas, 2006; Rew, 2000; Rhoades, Winetrobe, & Rice, 2015), increasing positive interactions from strangers (Brooks et al., 2012; Brooks et al., 2016; Hart, Hart, & Bergin, 1987; Valentine et al., 1993; Van Houtte & Jarvis, 1995) and companionship (Fifield & Forsyth, 1999; Putney, 2014; S. Ryan & Ziebland, 2015), there is little mention of life

circumstance, and it is assumed that life circumstance has not been considered in the research design. Meanwhile, in experimental studies of adversity (such as giving a speech or doing a mathematical task out loud), dogs have been reported to provide benefits such as decreasing perceived and/or physiologically experienced stress (Beetz et al., 2011). This has even been shown to occur more effectively than with human support (Allen, Blascovich, Tomaka, & Kelsey, 1991). Such examples suggest that there could be an untapped layer of contextual understanding that TTR theory is able to address.

Although companion dog relationships are usually not initiated for the purposes of obtaining additional assistance in times of adversity, some human-dog relationships, those involving specially trained assistance or therapy dogs, are. Therefore, understanding these differences in circumstances may be important in HAI research. Another factor to consider with assistance dogs is that some studies have found that, in addition to their trained roles, they provide specific support to their handlers in times of adversity, for which they have not been trained. This includes providing emotional comfort (Taylor, Edwards, & Pooley, 2013) and helping to regulate emotions in stressful situations (Love & Esnayra, 2009; Yount, Ritchie, Laurent, Chumley, & Olmert, 2013).

Qualities of support providers

The idea that more than one individual can provide support is widely acknowledged. Attachment theory researchers, for example, postulate that each recipient has a hierarchy of attachment figures. Studies employing the TTR theory, and social support more generally, postulate that many individuals with appropriate qualities, abilities or characteristics can provide support (B. C. Feeney & Collins, 2012, 2015b; Lakey & Cohen, 2000), and

that the quality of the relationship these individuals have with their support providers (or attachment figures) is influential in the quality of support that they will receive. A support provider who is responsive and can provide appropriate support is perceived to be the most beneficial.

Studies using attachment theory commonly evaluate the traits of a recipient rather than emphasizing qualities of support providers (Lowenstein, 2010). In contrast, social support theories and the TTR theory postulate that a situation can directly impact the type of support that should be provided (S. Cohen & Wills, 1985; B. C. Feeney & Collins, 2012). Hence, the support provider needs to have a well-functioning, close relationship with the recipient to provide sensitive and responsive support (B. C. Feeney & Collins, 2001). The TTR theory emphasizes the importance of understanding ‘provider qualities’ to offer the correct type of support for each life circumstance (B. C. Feeney & Collins, 2012). SOS support has been described as providing a safe haven, fortification, assisting in the reconstruction process and assisting to reframe/define adversity as a mechanism for positive change. Meanwhile, RC support should create opportunities for growth, provide assistance in viewing life opportunities, facilitate preparation for engagement in life opportunities and assist with implementation (B. C. Feeney & Collins, 2015b).

In the HAI research context, the ‘qualities of support’ given by non-human support providers are difficult to assess. However, the support provided by dogs could be framed through the qualities proposed in the TTR theory. HAI research recounts that some individuals have reported dogs to be their most important relationship (Lane et al., 1998), implying that they are close and well-functioning. Additionally, dogs are known to provide very responsive support to their handler. Assistance dogs, for example, have

been reported to notice changes indicating an impending panic attack or psychotic episode (Esnayra & Love, 2012), and can potentially be more responsive than human supports are able to be. Dogs, and especially assistance dogs, have also been praised for their ability to assist their handler to re-evaluate their perception of adversity, which acts as a mechanism for positive change. Perceived support from assistance dogs, for example, may allow their handler to feel in control of their life (Fairman & Huebner, 2001; Ng, James, & McDonald, 2000) as they are able to provide support without overwhelming the individual or making them feel helpless (Sanders, 2000). In other studies, support provided by assistance dogs has been reported to include fostering feelings of independence (Plowman, Bowan, & Williams, 2009; Vincent et al., 2015) and self-confidence (Herlache-Pretzer et al., 2017). These findings indicate that dogs may possess the necessary qualities to be considered ‘support providers’ for their handlers.

Immediate benefits of support

The TTR theory proposes that any immediate benefits experienced by the recipient indicate that the support provided was responsive and appropriate to the life context (B. C. Feeney & Collins, 2012). These ‘immediate benefits’ are conceptualized as mechanisms to encourage long term thriving and are important to better understand how a person can thrive through the assistance of a support provider (B. C. Feeney & Collins, 2015a). The indicators of thriving include immediate and positive changes in: emotional state; self-evaluations and self-perceptions; appraisals of the situation or event; motivational state; situation relevant behaviors or outcomes; relational outcomes; neural activation and physiological functioning; and lifestyle behaviors (B. C. Feeney & Collins, 2015a, 2015b). Each of these outcomes apply to both

SOS and RC support, however, they may present slightly differently in each context. They are also expected to occur just before and may overlap the long-term core thriving outcomes, but are conceptualized to make independent contributions toward long-term thriving (B. C. Feeney & Collins, 2014). For example, learning to perceive an event as challenging instead of stressful, can over time lead to thriving, as the individual's emotional state may be less negative and appraisal of the event more positive. However, these are immediate indicators because one instance of these changes would not indicate that the person is thriving, but rather a collection of these could contribute to the individual experiencing global thriving (B. C. Feeney & Collins, 2015a).

The social support construct outlines four categories of support an individual could provide/receive: emotional, informational, companionship and instrumental support (S. Cohen et al., 2000; B. R. Sarason et al., 1990; I. G. Sarason & Sarason, 1985). These outcomes are considered to be conceptually different but are not experientially independent (S. Cohen & Wills, 1985), although specific mechanisms have been suggested. It is well established that dogs are able to provide support within all four social support categories, and that people often feel safe (Fifield & Forsyth, 1999; Rew, 2000) and secure (Brooks et al., 2012) in the presence of their dog, as attachment theory proposes. There is also reason to believe that dogs provide other benefits, which reflect the eight 'immediate benefits' proposed in the TTR theory. Changes in emotional states (Brooks et al., 2016), such as a decrease in negative emotions such as anxiety (Andreassen et al., 2013) or stress (Kertes et al., 2017), have been commonly reported in dog studies. Individuals also perceive themselves to be more self-confident (Fifield & Forsyth, 1999; Paul & Serpell, 1996; Plowman et al., 2009; Van Houtte & Jarvis,

1995), and report that their dog makes the day easier (Andreassen et al., 2013). Commonly, dog owners report experiencing more motivation, such as to get out of bed (Brooks et al., 2016) or to interact with the community (Maharaj & Haney, 2014). Assistance dogs especially facilitate increases in situation relevant behaviors or outcomes by increasing their handler's ability to cope with, for example, a disability (Fairman & Huebner, 2001; Krause-Parello, Sarni, & Padden, 2016). Owners also perceive more positive relational outcomes, such as feelings of acceptance (Brooks et al., 2016; Putney, 2014).

In regard to neural activation and physiological functioning, owners have reported being more focused (Davis, Nattrass, O'Brien, Patronek, & MacCollin, 2004), less distracted by mental health concerns (Andreassen et al., 2013; Brooks et al., 2016), and have better overall health, especially from the exercise they receive because of their dog (Andreassen et al., 2013; Whitmarsh, 2005). Lifestyle behaviors have also been reported to change after acquiring a dog, such as increasing responsibility (Maharaj & Haney, 2014; Putney, 2014) or (re)entering the workforce, for individuals with assistance dogs (Fairman & Huebner, 2001; Herlache-Pretzer et al., 2017). The TTR theory therefore provides a more comprehensive and nuanced understanding of the impact of the support provided.

Long-term benefits of support

The immediate benefits or changes resulting from provisions of social support can lead to long-term benefits as well. Improved well-being is perceived to be the ultimate long-term outcome in much of the social support literature (S. Cohen & Wills, 1985). In the TTR theory, thriving is the ultimate outcome of receiving support (B. C. Feeney & Collins, 2015a); this is described similarly to well-being, and divided into the categories of hedonic, eudemonic,

psychological, social, and physical well-being (B. C. Feeney & Collins, 2015a, 2015b). These terms are commonly used within research, but not necessarily together (Hanson Frost et al., 2000; McKee-Ryan, Song, Wanberg, & Kinicki, 2005; R. M. Ryan & Deci, 2001), and well-being can be measured in multiple different ways (Hills & Argyle, 2002; Kahneman & Krueger, 2006). This complicates comparisons between the constructs. Attachment theory does not use well-being as the ultimate outcome of an attachment relationship, although the positive emotions and behavioral development that are associated with secure attachment are likely closely related to well-being (Lowenstein, 2010).

Recent descriptions of the TTR theory state that it includes five components of well-being (B. C. Feeney & Collins, 2015a, 2015b). However, Feeney and Collins (2012 and 2014) previously proposed ten indicators of long-term thriving: development of skills/talents, discovery of self and life purpose, accumulation of wisdom, development of core strength, positive view of oneself, positive view of others, movement toward full potential, relationship growth and prosperity, psychological health, and physical health. These long-term indicators are not independent of each other, but are acknowledged to be interrelated and to affect/influence each other (B. C. Feeney & Collins, 2014). The components are also additive, such that the more indicators a person displays, the more they are considered to be thriving (B. C. Feeney & Collins, 2014). The recognition that there are multiple aspects to thriving provides the TTR theory with scope to emphasize each benefit and to ascertain their relative effects on a person's overall life and ability to thrive.

The long-term benefits of human-animal relationships have been studied in HAI research, especially with dogs. Dog

owners commonly report increases in positive emotions (Davis et al., 2004; R. A. Johnson & Gayer, 2008) and positive behavioral development (Butterly et al., 2013). This would be expected, as dogs provide all the components to develop an attachment bond with their handler. Regarding social support, handlers have noted that dogs have increased their general well-being (Burrows et al., 2008; Collins et al., 2006; Putney, 2014). Based on HAI research it would be expected that other TTR long-term outcomes would be supported as well. The long-term outcomes of thriving have recently been investigated in HAI research regarding companion and assistance dogs. This original application of the TTR theory to dogs, using the ten indicators of long-term thriving, demonstrated that assistance dog handlers and companion dog owners perceived their dog to assist them to thrive in relation to all ten indicators of thriving (Gravrok et al., 2019). These more descriptive indicators may therefore provide greater understanding of how the support from an animal can impact a person's ability to thrive and should be considered further.

Strengths of the TTR theory

As should be clear from the preceding discussion, the TTR theory adds to existing theoretical frameworks used in human-dog relationship research in several ways. First, it allows researchers to focus on support in different life contexts, especially by promoting the value of support in times of normalcy. Support in times of adversity is most commonly explored in the prevailing constructs. This shift in perspective, from adversity to normalcy, is an important contribution because adversity does not define life for many people, and even if adversity occurs, it can often be overcome (Linley & Joseph, 2004). Hence the TTR theory enlarges the scope of existing theories, potentially explaining the benefits of

companion dogs for people whose lives are not characterized by ongoing adversity.

Additionally, the TTR theory postulates that if the qualities of the support provider match the support needed, these qualities will assist individuals to respond in such a way that they emerge from the situation more capable than they were before (B. C. Feeney & Collins, 2015b). This is an important enhancement to the social support construct, which focuses on the individual's context rather than the qualities of the support provider. Similarly, a hierarchy of support providers, as used in attachment theory, is not necessary, because any individual with the appropriate qualities could provide support.

Lastly, the TTR theory moves beyond the explanatory scope of the other commonly used constructs in HAI research, by providing more nuanced outcome measures. This potentially enables a more comprehensive understanding of the implications of the support provided, including the benefits a person will receive both immediately and long-term, emphasizing the temporal contribution of support. These outcome measures add to the well-being measures currently in use.

Limitations of the Thriving Through Relationships theory

The major limitation with the TTR theory is that it is relatively new and has not been tested experimentally. This should be taken into consideration, but the theory should not be discarded due to a lack of experimental support. Rather, it should be tested so that its usefulness can be ascertained. Other limitations identified include a lack of consistency in the terminology used in the four seminal publications (B. C. Feeney & Collins, 2012, 2014, 2015a, 2015b) that outline the immediate and long-term outcome measures of thriving. The theory's founders shifted from a model of 10 to one of 5 indicators of thriving without explanation in the initial

development of their work. They also adjusted the terminology for the immediate outcomes of thriving (the most current terminology is presented here). Feeney and Collins did not provide strict definitions of the eight immediate changes that can occur in the recipient nor the ten long-term indicators of thriving. Rather, they list qualities and characteristics indicative of each category. This may be beneficial in that there is no need to translate the definitions into human-animal terms. Also, since the theory proposes that the long-term indicators of thriving overlap each other, it may be less important to have clear definitions. These limitations, however, should be addressed in future research aiming to test the applicability of the TTR theory in HAI research.

Implications and future directions

The TTR theory is comparable to other constructs currently used in HAI research but provides a more comprehensive foundation to understand the potential benefits of social support. Thus, it may offer a new theoretical approach for explaining the perceived benefits that dogs are reported to provide. Additionally, this theory should not be limited to human-dog interactions. As human-dog relationships are commonly studied (Barker & Wolen, 2008), this provided the best foundation in which to initially explore human-animal interactions application to this theory. However, it is believed that the application of this theory could be expanded to other types of human-animal relationships, especially those that are perceived to be close and positive.

Future research should not limit itself to the constructs discussed therein. Increases in well-being are widely reported in HAI research, and there are many other theories in other fields that utilize well-being as an outcome measure. For example, Keyes (2002) proposes that physical, psychological and social well-being can be used to indicate flourishing, which is a similar concept to

thriving and is often used in the definition of thriving. Such parallel constructs deserve further consideration. As a starting point, however, the TTR theory provides a good foundation to explore HAI concepts further.

Conclusion

The current paper presented a brief introduction to attachment theory, social support and the biophilia hypothesis as they relate to HAI research examining dog-human relationships. It was identified that none of these constructs sufficiently explain the benefits that human-animal relationships provide, and that the Thriving Through Relationships (TTR) theory may be useful in this context. Our analysis suggests that the

TTR theory enhances the existing foundation to equip researchers to understand the impact of human-dog relationships. The inclusion of multiple contexts, along with the detailed articulation of the different types of support provided and multiple indicators of thriving in both short and longer terms, enhances application of the TTR theory. As the scope of HAI research increases, a more robust theory may emerge from the concepts presented here. Currently, however, the TTR theory appears to be a valid and applicable psychological theory to enhance understanding of human-animal relationships.

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