

Attachment and Sociability in Therapy Dogs

by
Shelby Hiigel Wanser

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Monique A. R. Udell

Adaptations of the Ainsworth's Strange Situation test, a social-development test based on Bowlby's attachment theory, can be applied to dog-owner relationships and used to categorize attachment styles in dogs. Dogs with secure attachment use their owner as a secure base from which to explore their environment and should theoretically be more likely to socialize with unfamiliar individuals. While pet dogs often interact with unfamiliar people, therapy dogs are specifically required to interact with unfamiliar therapy participants. The aim of the current study was to investigate whether therapy dogs with a secure attachment to their owners/handlers, and those with insecure attachment, behave differently in animal-assisted therapy. Therapy dog-owner dyads participated in an initial test from which attachment style was categorized. Later the dyads participated in a mock animal-assisted therapy session. Our findings indicate that in general therapy dogs spend a greater proportion of time in proximity to, and touching, the therapy participant than their owner during a therapy session; although they gaze more frequently at their owners. Attachment style did not reliably predict time spent in proximity to, and contact with, the therapy participant, however there was a noteworthy difference in the gazing behavior of dogs with different attachment styles.

Key Words: Therapy Dogs, Attachment, Sociability, Ainsworth Strange Situation
Test, Secure Base Effect, Proximity, Contact Seeking, Gaze, Animal Assisted Therapy,
Behavior

Corresponding e-mail address: wansers@onid.oregonstate.edu

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APPROVED:

Monique A. R. Udell, Mentor, representing Animal and Rangeland Sciences

Giovanna Rosenlicht, Committee Member, representing Animal and Rangeland Sciences

Sarina R. Saturn, Committee Member, representing Psychology

Toni Doolen, Dean, University Honors College

I understand that my project will become part of the permanent collection of Oregon State University, University Honors College. My signature below authorizes release of my project to any reader upon request.

Shelby Hiigel Wanser, Author

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Attachment and Sociability in Therapy Dogs

Introduction

The Ainsworth Strange Situation test is a social-development test based on Bowlby's attachment theory, which was originally designed to categorize human infant attachment behavior towards their mother. The test placed a human infant and their mother in an unfamiliar room in alternating conditions during which the infant was with the mother, a stranger, alone, and other combinations thereof. The behavior of the infant was analyzed, particularly during the phases when the mother returned after the infant had been left alone (Ainsworth, Bell, & Stayton, 1969).

The patterns of behavior seen in the Ainsworth Strange Situation test led to the development of three primary categories of attachment style: *Secure* – the individual (i.e. infant) shows signs of distress when separated from the attachment figure (i.e. mother), is eager to interact with the attachment figure upon their reunion, and then returns to normal independent behavior, *Insecure-Ambivalent* – the individual is highly distressed when separated from the attachment figure, is eager to interact upon their reunion, but is inconsolable and does not return to normal independent behavior, *Insecure-Avoidant* – individual may or may not be distressed when separated from the attachment figure, but upon their reunion the individual avoids or ignores the attachment figure (Topál, Miklósi, Csányi, & Dóka, 1998).

It has been demonstrated that the Ainsworth Strange Situation test and attachment theory can be appropriately applied to dog-owner dyads, as dogs appear to experience the secure-base effect in their owner's presence (Topál et al., 1998; Palmer & Custance, 2008; Mariti, Ricci, Zilocchi, & Gazzano, 2013). The secure base effect is the

“experience of security and comfort obtained from the relationship with the partner, and yet the ability to move off from the secure base provided by the partner, with confidence to engage in other activities” (Ainsworth, 1989). The presence of the mother, in the case of infants, or owner, in the case of pet dogs, provides the sense of security that gives the infant/dog the confidence to explore and engage with the environment (Bowlby, 1982). In most cases, the same attachment styles that have been used to categorize human infant attachment behavior can be used to categorize dog attachment behavior: secure, insecure-ambivalent, and insecure-avoidant. Those identified to have secure attachment styles experience the secure base effect and are more likely to engage with their environment provided their attachment figure is present. The research that has been conducted with human infant attachment styles has demonstrated that securely attached individuals are less disturbed by the presence of a stranger in contrast to insecurely attached individuals. When their attachment figure is present, securely attached individuals, experiencing the secure base effect, have been shown to be more likely to interact with an unfamiliar person (Bowlby, 1982).

Evidence has demonstrated that dogs can provide social support and even serve as attachment figures for humans (Crawford, Worsham, & Swinehart, 2006; Cusack, 1988; Zilcha-Mano, Mikulincer, & Shaver, 2012). While this is important in the context of the owner-pet relationships, this bidirectional attachment behavior may also be especially relevant in certain working contexts such as animal-assisted therapy. Animal-assisted therapy is a therapeutic approach in which animals are used to enhance the treatment of a client. This approach is used in an immense variety of settings and for a wide variety of therapeutic purposes, including in psychotherapy, physical therapy, speech therapy, play

therapy for children, therapy for children with autism, or simply improving the quality of life of someone in a hospital, assisted-living facility, or rehabilitation center (Arkow, 1984; Cusack, 1988; Fine, 2010; Tsai, 2007). Therapy animals are often pet dogs trained by their owner, whom they will work alongside when performing therapy activities. Therapy activities with dogs generally involve an owner/handler directing their dog to engage with an unfamiliar therapy participant. This typically would involve the dog approaching and touching the unfamiliar person, allowing them to pet him/her, while the person may talk to, or play with, the dog or other times sit passively in the presence of the dog. In some cases the handler may be a professional therapist who uses the dog within their work, however many owners who train their dogs for therapy work are lay people who provide therapy visits to such places as hospitals, schools, assisted-living facilities, and correctional facilities, as part of a therapy dog group or organization.

Therapy dog training, and in some settings certification, requires dogs to demonstrate excellent obedience, an aptitude for therapy work with unfamiliar people, and appropriate and reliable responses to potential stimuli including unfamiliar places, objects, sounds, smells, and atypical behavior from adults and children, such as unusual touch and petting behavior and vocalizations (“Therapy Dogs International Testing Requirements,” n.d.). Given the nature of this work, it is often critical that dogs not only feel comfortable in novel or ‘strange’ environments but are willing to leave the proximity of their owner in such situations – often approaching and interacting with a stranger (the therapy participant) instead.

Consequently, it seems possible that therapy dogs with a secure attachment to their owner/handler might be at an advantage in such settings, however to date, no study

has investigated whether a therapy dog's response in the therapy setting is impacted by the dog's style of attachment to the owner/handler.

The aim of the current study was to investigate whether attachment style impacts the behavior of dogs in animal-assisted therapy activities. Sixteen therapy dog-owner dyads participated in an initial attachment test used to categorize the dog's attachment style, and on a separate occasion they participated in a mock animal-assisted therapy session. The proportion of time the therapy dog spent in contact with, proximity to, and gazing at, the therapy participant in comparison to the owner was analyzed to evaluate any differences in the behavior in the therapy setting between dogs identified to have a secure attachment with their owner and those identified to have an insecure attachment.

It was expected that therapy dogs exhibiting a secure attachment style would spend a greater proportion of time in contact with, proximity to, and gazing at, the therapy participant in comparison to the owner, than the dogs exhibiting an insecure attachment style. If supported, the results would also suggest that the therapy dogs with secure attachment use their owner as a secure base within therapeutic contexts.

Methods

Participants

Sixteen therapy dogs were recruited through personal contact, and advertisement on a local therapy dog listserv. Four owners had two therapy dogs each with whom they participated in the study, seven owners had one therapy dog each, and one person was the trainer and handler of a therapy dog who lived in their neighbor's household. Of the twelve owners/handlers, ten were women (accounting for thirteen of the dogs) and two

were men (three of the dogs). Dogs comprised ten males (five neutered prior to study; one neutered between the two sessions of the study) and six females (all spayed), ranging in age from six months to twelve years. Participants included three golden retrievers, two German shepherds, two whippets, one Australian shepherd, one Labrador retriever, one Shiloh shepherd, one smooth collie, one Pembroke Welsh corgi, one miniature poodle, and three mixed-breeds. Dogs' therapy experience ranged from two months to eight years. In addition to working as therapy dogs in service to others, four dogs were also working service dogs for their owner.

Testing area

The testing area was a sparsely furnished room measuring 13 feet by 14 feet. The room had one window and two doors but only one door was used for entrance and exit. For the attachment test, one chair was located along a wall approximately 10 feet from the door. A three foot radius was measured around the chair with tape. A tripod and video camera were located in the corner opposite the door and chair. Similar to other canine attachment tests, three toys – a tennis ball, a squeaky toy, and a rope toy – were spread out on the floor outside of the taped circle. For the therapy session, two chairs were located facing each other at a right angle in the corner of the room opposite the door. Two tangential circles with 26 inch radii were taped on the floor, one around each chair. The tripod and video camera were near the door, opposite from the chairs.

Procedure

Testing consisted of two phases: (1) A modified canine attachment test used to evaluate the form of attachment dog participants displayed towards their owners (who also serve as their handlers in their therapy dog working roles). (2) A mock animal-assisted therapy session from which the behavior of each dog – towards his or her owner and towards a mock therapy participant – was evaluated to see if attachment style, as defined in Phase 1, would influence attentiveness to owner and/or therapy participant in a work setting.

Attachment test procedure

There were two female experimenters: E1 provided instructions that guided owner/experimenter behavior at the start of each condition (E1 remained outside of the room during all conditions). E2 stood neutrally/inattentively in the corner of the room controlling the video camera (except for during the alone condition during which the camera was set on a tripod facing the door). The attachment test was divided into three conditions, each lasting two minutes.

Baseline condition

The experimenter led the therapy dog and owner into the room and indicated for the owner to remove the dog's leash and take a seat in the chair. The owner was instructed that when the dog entered the circle surrounding their chair, they could interact with the dog (i.e. talking, petting, playing), but when the dog was outside the circle, they must remain silent, passive, and non-moving (no talking, no gestures).

Alone condition

E1 opened the door to indicate to the owner to stand up, say “goodbye” to the dog, and exit the room. E2 placed the camera on the tripod and left it filming in the direction of the door and followed the experimenter and owner out of the room, leaving the dog alone. The primary purpose of the alone phase was to serve as a mild stressor or strange situation, which would allow for assessment of the secure base effect (greeting of owner, followed by return to play or exploratory behavior) during the return condition.

Return condition

E1 directed the owner to enter the room and sit back down in the chair. E2 followed closely behind the owner in entering the room and returned to the corner to control the camera, without any interaction with the dog. The owner’s instructions were the same as for the baseline condition: when the dog entered the circle surrounding their chair, they could interact with the dog, but when the dog was outside the circle, they must remain silent, passive, and non-moving.

Animal-assisted therapy session procedure

At a later date, four days to one month post attachment test, the dog-owner dyads returned to the same testing location for a mock animal-assisted therapy session. There were two female experimenters. E1 provided instructions prior to the session. A different E2 than the person involved with the attachment test (unfamiliar to the dog and dog owner/handler) acted as the therapy participant. The therapy participant was seated in one of the two chairs prior to the dog’s arrival. The owner was instructed to enter the

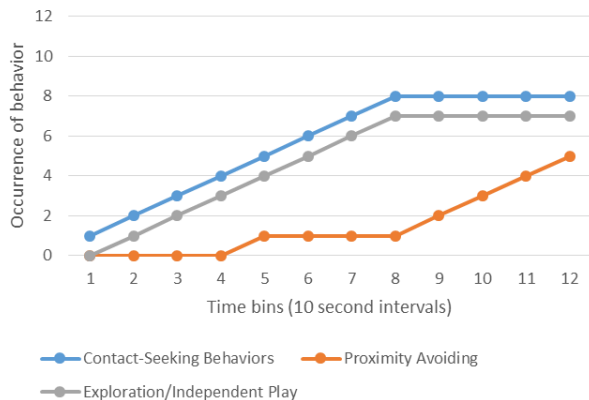
room with their dog, introduce themselves and the dog to the participant, give the dog whatever greeting command they would typically use on a therapy visit, and then sit down in the chair next to the participant. The session lasted for seven minutes with the first minute as a habituation period (when the therapy dog and owner/handler entered the room and greeted the mock therapy participant); this phase occurred prior to analysis of the dog's behavior, as the true therapy intervention began after habituation to the environment. The remaining six minutes consisted of the mock therapy session during which the dog's behavior was video recorded and later analyzed. The dog remained on leash (owner holding the end of the leash) for the entire session, but was to have freedom of movement between and around the owner and therapy participant to the extent the leash's length permitted (about six feet). This was done to remain consistent with the therapy dog practices these dyads would encounter in their working roles with actual therapy participants. The owner and the therapy participant were required to stay seated in their designated chairs located within the taped circles on the floor for the duration of the session. For the three small dogs (less than twenty-five pounds), both owner and participant sat on the floor in the same spots that the chairs were located with larger dogs. The therapy participant was instructed to casually talk to the dog and with the owner, as they engaged in petting and interacting with the therapy dog. The owner was instructed to engage with their dog and the therapy participant in the session as closely as to how they would in a normal therapy session, while remaining in the designated location.

Data collection and analysis

Attachment test

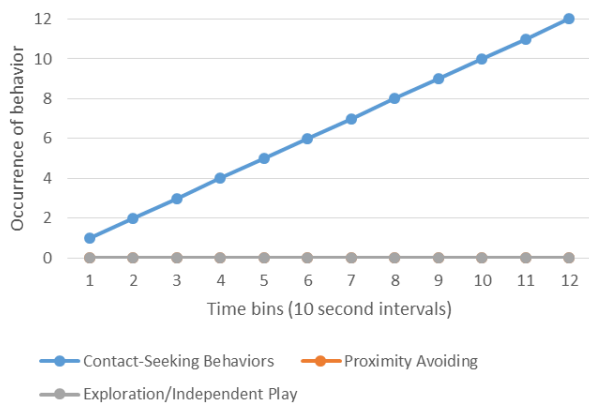
From the video recordings, the two minute return condition was analyzed and coded in ten second bins for six behaviors within three behavioral categories: contact-seeking behavior (dog-human contact, proximity seeking, and social play), proximity avoiding behavior (sitting, laying, or standing away from human contact), and independent activity (playing with a toy independently from human or exploring room). Plots were charted for each dog for the occurrence of contact-seeking behaviors, proximity avoiding behavior, and independent activity over the course of the two minute return condition. Based on categorizations of secure and insecure attachment styles, the plots were used to identify securely and insecurely attached dogs within the sample. See Figure 1.

Figure 1: Categorization of Attachment Styles



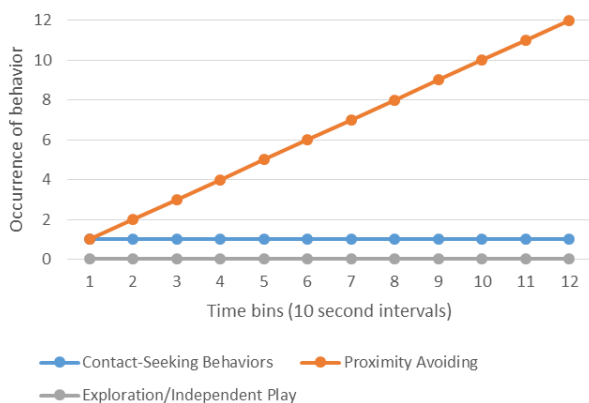
A) Secure Attachment –

Characteristic features: contact-seeking behavior occurs in the first time bin and in at least 5 time bins overall, in addition to at least 3 occurrences of exploration/play; proximity-avoiding behavior may occur in later half of condition as well



B) Insecure-Ambivalent Attachment –

Characteristic features: contact-seeking behavior occurs in at least 11 time bins, with only 2 or fewer occurrences of exploration/play and/or proximity-avoiding



C) Insecure-Avoidant Attachment –

Characteristic features: predominantly proximity-avoiding and/or exploration/play behavior, with a maximum of 1 occurrence of contact-seeking behavior

Attachment graphs were analyzed by two independent coders, who placed each dog into the categories of secure, insecure-ambivalent, and insecure-avoidant attachment. Agreement was independently reached for 15/16 dogs (IOR: 94% agreement), in all cases attachment categorization used in the analysis was determined by Coder 1.

Therapy session

Video of the dog's behavior during the six-minute mock therapy session was analyzed and coded using JWatcher coding software. The video for each dog was coded twice: once for the interaction between the therapy dog and the therapy participant and a second time for the interaction between the therapy dog and the owner. The behavioral states recorded were: gazing at the participant, touching the participant, participant proximity seeking (entering the participant's circle), gazing at the owner, touching the owner, and owner proximity seeking (entering the owner's circle). The proportion of time spent engaging in each behavior during the six minute period was recorded.

Videos were analyzed by two independent coders. An 8% range of tolerance (based on proportion of total time for each behavior) was used in evaluation of inter-observer reliability. For gazing at the participant there was 87.5% agreement, 100% agreement for touching the participant, 93.8% agreement for participant proximity seeking, 75% agreement for gazing at owner, 81.2% agreement for touching the owner, and 87.5% agreement for owner proximity seeking. All data used in the analysis was determined by Coder 1.

Results

Based on the outcome of the initial attachment test (Phase 1), nine dogs were categorized as securely attached (see Figure 1A), six dogs categorized as insecure-ambivalent (see Figure 1B), and one dog as insecure-avoidant (see Figure 1C). Given that the secure base effect is the distinguishing factor between a secure attachment style and both categories of insecure attachment, the insecure-ambivalent and insecure-avoidant dogs were combined into one group: Insecure. Thus, nine dogs were categorized with secure attachment and seven dogs were categorized with insecure attachment. These designations were then used to determine if attachment style predicted different levels of responsiveness toward a therapy participant and owner in a mock therapy session (Phase 2).

Dogs of both secure and insecure attachment styles showed statistically significant differences in the proportion of time spent touching the owner versus the participant (secure dogs $p < 0.0001$ paired t-test, see Figure 2; insecure dogs $p = 0.0001$ paired t-test, see Figure 3). However, there was not a statistically significant difference between the dogs with insecure attachment styles and secure attachment styles in terms of the proportion of time spent touching the owner ($p = 0.1519$ unpaired t-test) or the participant ($p = 0.8562$ unpaired t-test).

Figure 2

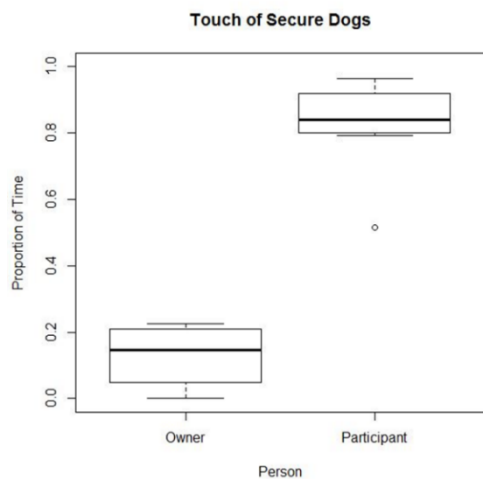
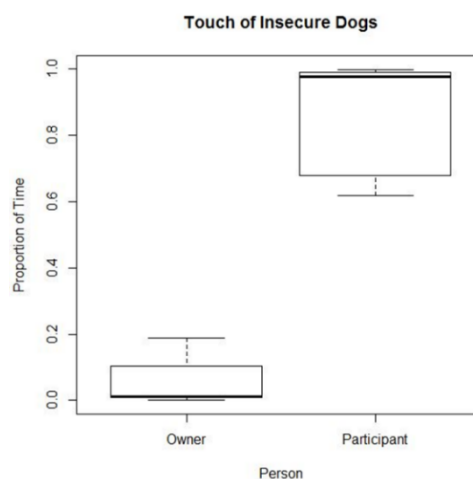


Figure 3



There was also a statistically significant difference in the proportion of time that dogs of each attachment style spent in proximity to the owner versus the participant (secure dogs $p = 0.0005$ paired t-test, see Figure 4; insecure dogs $p = 0.0101$ paired t-test, see Figure 5). Statistical significance was not found however, in the difference between insecure and secure attachment styles in terms of the proportion of time spent in proximity to the owner ($p = 0.7669$ unpaired t-test) or the participant ($p = 0.9557$ unpaired t-test).

Figure 4

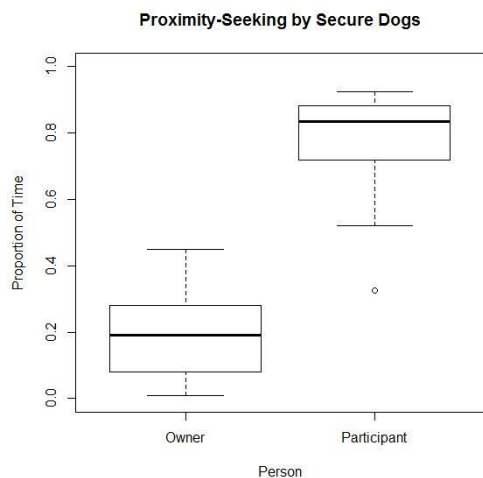
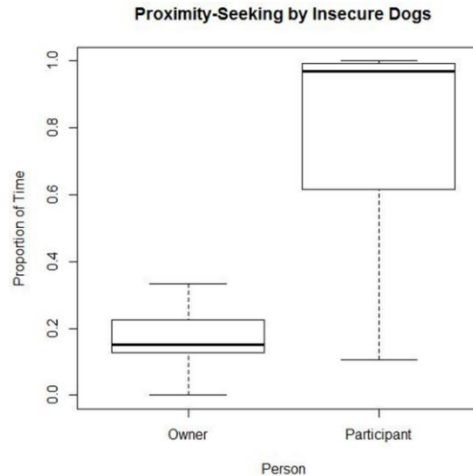


Figure 5



There was not a statistically significant difference between the therapy dogs with insecure attachment styles and secure attachment styles in terms of the proportion of time they spent gazing at the owner ($p = 0.2391$ unpaired t-test) or at the participant ($p = 0.2846$ unpaired t-test). However, a trend was noted (see Figure 7) among the dogs with insecure attachment, suggesting that they gazed at their owner for more time than they gazed at the participant ($p = 0.0904$ paired t-test). On the other hand, the dogs with secure attachment did not differ significantly in the proportion of time spent gazing at the owner versus the participant ($p = 0.1509$ paired t-test, see Figure 6).

Figure 6

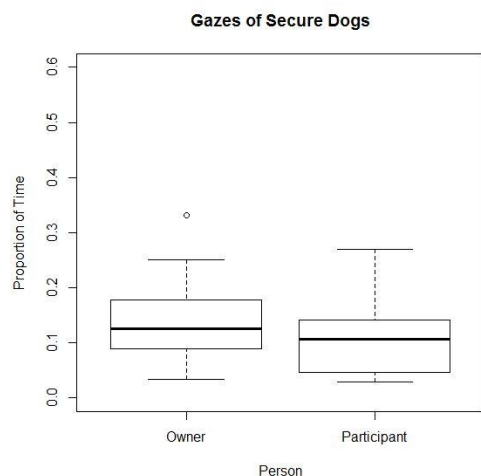
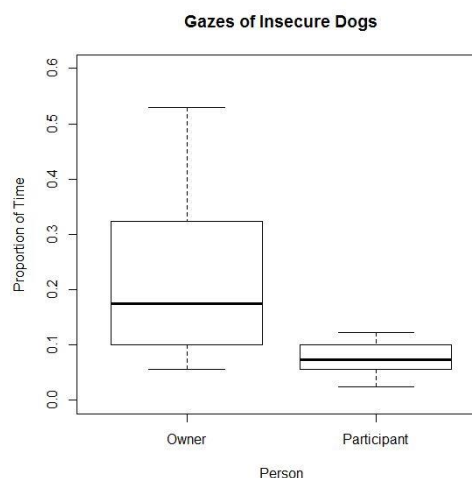


Figure 7



Additionally, we evaluated whether secure versus insecure dogs spent a significantly greater proportion of time focused on the therapy participant versus the owner using difference scores. Difference scores were calculated by subtracting the proportion of total testing time spent gazing at, touching, or in proximity to the owner from the proportion of total testing time spent gazing at, touching, or in proximity to the mock therapy participant, and then compared these values for dogs categorized as secure

versus insecure using independent unpaired t-tests. Kolmogorov-Smirnov Comparison of two data sets suggested that the data was consistent with a normal distribution. These tests found no statistically significant differences between dogs labeled as secure versus insecure in terms of gaze ($t(14) = 1.62, p = 0.13$), touch ($t(14) = 0.73, p = 0.48$), or proximity seeking ($t(14) = 0.16, p = 0.88$).

The behavior of all dogs as a group was then analyzed to determine if different patterns of behavior towards their owner versus a therapy participant in the therapy setting would be observed. A Kolmogorov-Smirnov test did not confirm a normal distribution for all measures so a Wilcoxon Signed-Rank test was used. Therapy dogs in general spent a significantly greater proportion of time touching the therapy participant ($Z = -3.52, p < 0.001$, see Figure 8) and in proximity to the therapy participant ($Z = -3.36, p < 0.001$, see Figure 9) than their owner. On the other hand, therapy dogs in general spent a significantly greater proportion of time gazing at the owner than gazing at the therapy participant ($Z = -2.12, p = 0.03$, see Figure 10).

Figure 8

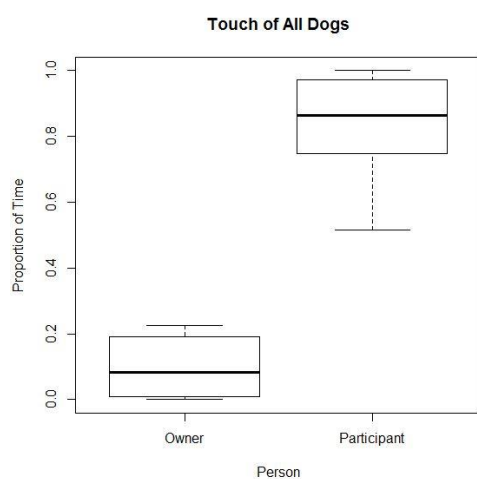


Figure 9

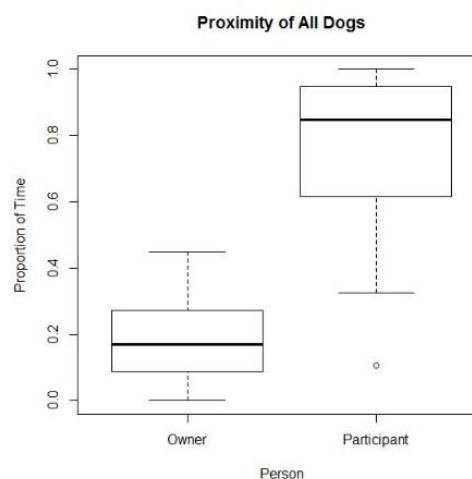
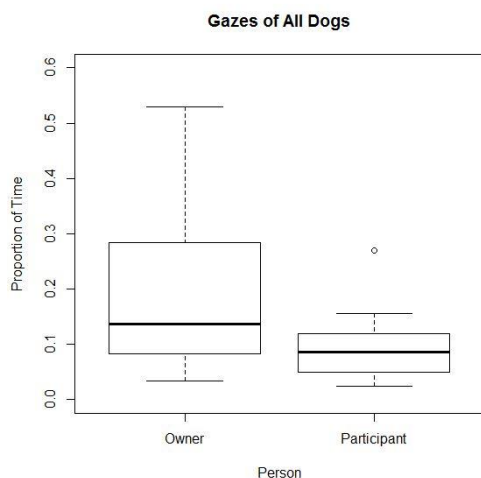


Figure 10



Discussion

Overall the patterns of behavior demonstrated by therapy dogs with secure and insecure attachments towards their handlers in a therapeutic setting were more similar than different. The results of this study suggest that, in general, therapy dogs spend a greater proportion of time in proximity to and touching the therapy participant than their owner during a therapy session, independent of attachment style towards their owner. The trend that appears for the dogs' gazes is the opposite; therapy dogs gaze at their owners more than at the therapy participant. However, when comparing dogs with secure and insecure attachment styles separately, insecurely attached dogs appear to spend more time gazing at the owner than gazing at the therapy participant, while securely attached dogs appear to spend closer proportions of time gazing at both people. This trend could suggest that there is a difference in the way therapy dogs engage in the therapy work that is related to their attachment style with their owner. However it is important to note that this trend was not statistically significant, thus this finding would benefit from further investigation with large sample sizes.

Therapy dogs have been specifically trained to engage with unfamiliar therapy participants by remaining close to the stranger and allowing that person to pet them. Thus, it is not surprising that therapy dogs demonstrated greater time spent in proximity to, and touching, the therapy participant than the owner; their training history may outweigh the influence of attachment style towards their owner in this case. However, a therapy dog's gaze to one person or the other during a therapy session is not instructed by the owner, therefore it is possible that gaze could be the more indicative behavior of differences between therapy dogs with secure and insecure attachment styles with their owners.

The question this poses is what significance the dog's gaze has. Interpretation of the dog's gaze could be taken in many ways. It is possible that the secure base effect is a determining factor in directional gazes during therapy sessions. It was observed in the Ainsworth Strange Situation test that children often kept their eyes and/or posture oriented toward their mother while being held by an unfamiliar person (Bowlby, 1982). Gazing is a form of social referencing, the seeking of information from another individual from which to base one's response to a stimulus or from which to base one's actions. When the stimulus is the unfamiliar therapy participant, the dog may be gazing at their owner to gain information about how to interact with the other person. In social referencing the individual alternates their gaze between the informant and stimulus and bases their response on the information gained from the informant (Merola, Prato-Previde, & Marshall-Pescini, 2011). In one study, dogs' social referencing between their owner and a stranger was investigated. It was concluded in that study that the dogs alternated their gaze between both people similarly, but that the dogs based their behavior

more on the cues received from the owner than from the stranger (Merola, Prato-Previde, & Marshall-Pescini, 2012).

Consistent with the secure base effect, the owner's presence would give the securely attached dogs the base from which to perform the therapy work. The secure dogs may not need to refer to their owner for much reinforcement or guidance, so they could be expected to gaze at each person for roughly similar amounts of time as Merola et al. (2012) demonstrated. In contrast, insecurely attached dogs may gaze at the owner more, looking for reassurance. The prolonged interaction with the therapy participant by insecure dogs may be a result of training more than an independent drive to engage with the unfamiliar person. Interactions as such may be interpreted as an attention seeking behavior to gain the owner's reinforcement. If true, one potential consideration for future research is whether animal-assisted therapy activities result in higher stress levels for some animals (i.e. those with insecure attachments) more than others, even if both show similar levels of interaction with the therapy participant. This could have important welfare implications.

A recent study concluded that both dogs and owners experience increased urinary oxytocin concentrations as a result of mutual gazing. The duration of time the dog spent gazing at the owner was proportional to the change in the oxytocin level of both the dog and owner (Nagasawa et al., 2015). All of the therapy dogs spent some time gazing at their owner, thus increasing oxytocin in both themselves and their owner/handler. It is possible that the therapy dogs with insecure attachment styles spend more time gazing at their owner because the simple act of gazing increases their levels of oxytocin, thus being rewarding in and of itself, in addition to receiving praise from the owner for engaging

with the therapy participant. The increased oxytocin concentration gained by gazing at the owner could be reducing possible stress that the insecure dogs may experience in engaging with an unfamiliar person.

Four dogs in this study were not only therapy dogs, but also work as service dogs for their owners when not performing therapy work. Among these four service dogs, two were categorized as exhibiting a secure attachment style and two exhibited an insecure attachment style. This is an interesting finding in itself, as one might expect service dogs to demonstrate the same attachment styles. What makes this even more interesting is that two of these service dogs both work as mobility assistance dogs for the same owner. Thus, both dogs have received the same training and socialization, only differing in their age and length of experience. These results in the attachment test imply that attachment style may truly be a difference in personality more than an effect of training.

In another observation from this study, the one dog who was trained by, and performs therapy work with, the neighbor rather than their owner, presented a secure attachment style with this handler. One might wonder how dogs' attachment styles compare with the different people they have strong relationships with. This could also be a direction of future investigation.

It has been suggested that a therapy dog might become a figure in a therapy participant's "attachment hierarchy," thus providing a secure base in the therapy setting (Zilcha-Mano, Mikulincer, & Shaver, 2011). Bowlby reasoned that a therapist must have the ability to serve as a sort of attachment figure for their client, because the client must feel safe and secure to delve into painful histories (Bowlby, 2005). In this reasoning, there is the proposal that the secure base effect theoretically occurs in the therapist-client

relationship and catalyzes the therapeutic work. When a dog is brought into the therapy work, it may be easier for a person who has difficulty trusting or engaging with other people, to trust an animal. Positive interactions that a client could have with a therapy dog could help improve the individual's ability to connect with, and eventually form attachments with, other people (Zilcha-Mano et al., 2011). Bowlby (1982) explained that the attachment figure (the owner) is distinct from the "playmate" (therapy participant), but the roles are not mutually exclusive, as in the attachment figure could also take on the role of playmate at times, and sometimes playmates can act as "subsidiary attachment-figures." This supports the idea that a therapist or a therapy dog might fill a "subsidiary attachment-figure" role in therapeutic settings. It is in these many ways in which dogs and humans connect that we find the significance of the attachment bonds between dogs and owners, and the value in the potential role of a therapy dog as a sort of temporary secure base within a therapy setting. The dog may be providing a secure-base-type effect for the therapy participant. Thus the influence of attachment style, or differences in canine behavior, on the attachment of the therapy participant to the dog might also be worth exploring further in the future.

Lastly, it would be interesting to pursue further research into the effects of training on attachment styles, for example in service dogs within the same training programs. The potential for finding indicators of dog personality traits that would inform us of their most suitable placements as service dogs, therapy dogs, working dogs, or pet dogs would be beneficial to their welfare. Dogs would not be placed in roles that cause them excessive stress, but rather they could be selected for roles in which they will have a propensity to thrive.

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