A Companion Animal in a Work Simulation: 
The Roles of Task Difficulty and Prior 
Companion-Animal Guardianship in State Anxiety

Anna Stewart and Oriel Strickland 
California State University-Sacramento 
ojstrick@csus.edu

Abstract
Human-animal interactions often have positive physiological and psychological outcomes for humans. The current study extended research in this area by studying three variables that have never directly been examined together within a laboratory setting: task difficulty level (moderate versus extreme), the human-animal interaction (present or absent), and participants' companion-animal guardianship status (yes or no) to determine whether a companion dog would reduce self-reported state anxiety. The participants were undergraduate students from a large western university in the United States who performed timed paper-and-pencil tasks either with or without the presence of a companion dog under varying degrees of task difficulty. Spielberger's State/Trait anxiety measures were used to assess reactions to the work setting. Results indicated that although the mere presence of a dog is not enough to lower state anxiety for all participants, the interaction of companion-animal guardianship status and task difficulty was significant. Companion animals may assist in stress relief for people in average-stress jobs who already have positive feelings toward companion animals but may have no effect for people in high-stress jobs or who do not already enjoy the company of animals.

Keywords 
anxiety, companion animal, dog, stress, task difficulty

The reduction of stress in the workplace has been related to decreases in health care costs and lost time and increases in employee productivity (Oberlechner & Nimgade, 2005; Manning, Jackson, & Fusilier, 1996). For instance, Weaver (2003) suggests that absences due to psychological stress have been estimated to result in a loss of $57 billion each year. Lowering stress in the workplace may not only decrease employee absenteeism but may result in higher levels of productivity. Oberlechner and Nimgade (2005), for example, found that financial traders who reported less stress in their jobs also received higher performance ratings by their supervisors. Netemeyer, Maxham, and Pullig (2005)
also found a relationship between work stress and performance. Their study of customer service employees revealed that workers with more stress on the job received lower ratings of in-role performance. Similarly, van der Linden, Keijsers, Eling, and van Schaijk (2005) studied participants of various occupational backgrounds who were being treated for job-related burnout. The researchers found that the level of burnout was significantly related to the number of cognitive failures in everyday life and to performance variability in attentional tasks.

Organizations may take large-scale approaches to reduce employee stress (e.g., assessing the person-environment fit, providing more training, clarification of role relationships, or changing the core of the organizational structure). However, in practice, most stress management techniques center on individual interventions (Morrison & Payne, 2003; DeFrank & Cooper, 1987). Interventions directed to the individual include the use of meditation, exercise, relaxation training, biofeedback measures, or attendance of optional stress-management seminars (Caulfield, Chang, Dollard, & Elshaug, 2004; Matteson & Ivancevich, 1987). Many employers now offer discounted, group-rate gym memberships to encourage their employees to participate in regular exercise; unfortunately, these programs may be cost-prohibitive for many businesses or low-wage employees.

A lower-cost approach to stress management at the workplace is to include a policy that allows employees to bring their companion animals to work. Including a nonhuman animal in the workplace could reduce the stress of employees and provide greater performance on the job. In fact, a few studies evaluating the effect of the presence of nonhuman animals in a job or joblike setting have been conducted. Granger and Carter (1991) found that nursing home volunteers who were accompanied by a companion animal during visits felt the job was more enjoyable than volunteers who visited without a companion animal.

In anecdotal accounts, having a dog or multiple dogs in the workplace provides many benefits. A survey conducted by the American Pet Products Manufacturers Association reports that, of the companies surveyed, “73 percent said pets create a more productive work environment. 27 percent reported a decrease in employee absenteeism. 96 percent said pets created positive work relations. 58 percent of employees stayed late with pets at the office.” According to this survey, 50 million employees feel that coworkers get along better when companion animals are allowed in the workplace and 37 million employees think that having companion animals in the workplace improves manager-employee relationships (American Pet Products Manufacturers Association, 2006, ¶ 3). Because of the commercial nature of this organization, the results
of this survey may be biased in support of the inclusion of companion animals at the workplace. However, the survey does provide preliminary information indicating that companion animals at work can be associated with a variety of positive outcomes for employees.

Other studies have demonstrated that companion animals have a positive effect on humans’ mental health in a variety of settings and seem to facilitate psychotherapy. Brasic (1998) found that the presence of a nonhuman animal in individual child psychotherapy settings facilitated the development of the therapeutic alliance by fostering trust between the child and the therapist. Netting, Wilson, and New (1987) cited the popularity of the use of companion animals in facilities such as hospitals, assisted living environments for the elderly, and correctional facilities. McNicholas et al. (2005) suggested that service animals (dogs for the blind or physically limited) provide a catalyst for social interaction with people who might otherwise feel ignored or socially isolated. In a review of the literature, Jalongo, Astorino, and Bomboy (2004) noted that a child with a disability was 10 times more likely to interact with nondisabled children if he/she had a dog. Lutwack-Bloom, Wijewickrama, and Smith (2005) found that visits by a volunteer with an accompanying dog to hospitalized elderly people had a more positive effect on the patients’ moods than visits from a volunteer without a dog.

Kaminski, Pellino, and Wish (2002) compared the effects of a visiting companion animal to a child-life therapy program for hospitalized children. The children’s parents rated the patient’s mood prior to and after either the child-life program or the visiting animal program. While parents in both groups reported that their children had significantly higher moods after either program, the children who participated in the companion animal therapy group had significantly higher mood reports than those in the child-life program. Similarly, Wilson (1991) found that participants’ state anxiety and blood pressure were significantly lower during interaction with an unknown dog than while reading aloud. Participants with companion animals also reported lower anxiety reactions during stressful times. Kidd and Kidd (1999) examined the benefits of fish, another popular American companion animal. Despite the reported drawbacks of fish care, keepers of fish felt calmer, more relaxed, serene, and experienced less stress just by watching their fish.

Based on prior research demonstrating that the presence of animals has psychological benefits for humans, this study hypothesized that:

Hypothesis 1. There will be a significant main effect of animal presence on self-reported state anxiety such that state anxiety will be lower when a companion animal is present.
Moderating Effect of Task Difficulty

Some research has suggested that extremely difficult or challenging tasks can override the stress-reducing effects of a nonhuman animal. For instance, Straatman, Hanson, Endenburg, and Mol (1997) asked male college students to prepare for and give a speech on vivisection. The students were videotaped and told that their speeches were being watched by other researchers in the building and might be broadcast to an international convention in Geneva. The researchers monitored heart rate and blood pressure and tested for state anxiety surrounding the stressful event. Approximately half the sample (17 students) were allowed to have a small, friendly, unfamiliar dog sit on their lap, whereas the other half (19 students) were not. The authors’ findings indicated no significant effect of the presence of the dog on moderation of physiological stress and state anxiety. They concluded that the difficulty of the task may have overridden the benefits of the animal.

Similarly, Havener et al. (2001) wanted to study the potential stress-reduction effects of a nonhuman animal in the room during dental procedures for children. This task may be considered a demanding, high-stress task for children, and they may not have been able to connect with the dog in the room in any meaningful way. The results of the study did not support the overall stress-reducing effect of the companion dog but again may hint at a moderating variable in the effect of dogs on humans’ well-being.

From a theoretical perspective, cognitive resources may be overloaded if the task difficulty is too demanding. This is discussed by LePine (2005), who notes that in tasks of high complexity or novelty, individuals may be so focused on their performance of the task that their ability to cope with stress/anxiety is reduced. This research supports the speculations of Straatman et al. that their public-speaking task may have been so stressful or difficult that it outweighed the possible stress-reducing effects of the companion animal.

To generalize this concept to an occupational setting, overwhelmed employees may not only fail to gain benefit from stress-reducing activities (e.g., meditation, exercise, interacting with a companion animal), but they may not participate in the coping activities at all, because they are too focused on their work performance.

Given the current state of the literature, it is believed that there will be a psychological benefit of a companion animal in a moderately stressful situation, such as those encountered in many workplaces in the United States. Studies by Havener et al. (2001) and Straatman, Hanson, Endenburg, and Mol (1997) exposed their participants to tasks or experiences that may have been too stressful to allow the potential benefits of the companion animal to be detected. Previous empirical studies (e.g., Wood & Lock, 1990, cited in
LePine, 2005) have found that stress resulting from extremely difficult tasks or work overload is not effectively reduced by most interventions. Therefore, the following hypothesis is made.

**Hypothesis 2.** There will be a two-way interaction between animal presence and task difficulty on state anxiety. Specifically, the stress-reducing effects of the companion animal will only be observed under the moderate-task difficulty condition.

**Moderating Effect of Companion-Animal Guardianship**

Some literature has noted that people do not universally believe that companion animals are physiologically or psychologically beneficial to them (Staats, Sears, & Pierfelice, 2006). In a survey of a large Midwestern university’s faculty, Staats, Sears, and Pierfelice (2006) found that the majority of the participants had favorable attitudes toward companion animals; however, others did not. When asked if they felt that “pets have had a good effect on your health” in the past, 62.3% endorsed “maybe,” “somewhat,” or “definitely.” However, 18.9% said that they didn’t think companion animals had had a good effect on their past health. In response to the same question in the present, 52% said “maybe,” “somewhat,” or “definitely,” while 21.2% endorsed “no.” When asked whether they thought that companion animals would have a positive effect on their health in the future, 69.2% endorsed “maybe,” “somewhat,” or “definitely,” while 24.8% said “no.” Not surprisingly, the authors found significant correlations (all at $P < .001$) between companion-animal guardianship and participants’ beliefs about the health benefits of companion animals (past: $r = .24$, present: $r = .32$, future: $r = .32$).

Based on these findings, it was believed that companion-animal guardianship status would play a significant role in the stress-reducing effects of a companion animal. More specifically, the anxiety-reducing effects of the dog under moderate task difficulty would only be observed for participants who kept companion animals. To test this interactive hypothesis, this study included both general companion animal guardianship as well as dog guardianship, in order to identify more closely who would benefit from the presence of a companion animal.

**Hypothesis 3.** There will be a significant three-way interaction among animal presence, task difficulty level, and companion-animal guardianship on state anxiety. Specifically, the stress-reducing properties of the companion animal
would only be observed under moderate task difficulty among participants who keep a companion animal.

As mentioned above, the literature suggests that some people gravitate toward companion animals, whereas others do not (Staats, Sears, & Pierfelice, 2006). Given potential differences among the “companion-animal guardianship” category, we explored the possibility that this category was too broad and too complicated to show a beneficial effect of the companion dog. According to a recent publication by Noonan (2008), companion-animal guardians often classify themselves as either cat people or dog people or may be entirely dismissive of companion-animal guardianship. Additional work along this line (Woodward & Bauer, 2007) has examined differences between companion-animal guardians’ preferences by highlighting the relatively recent domestication of cats (approximately 6,000 years) compared with the domestication of dogs (approximately 12,000 years). These authors go on to suggest that keepers of cats prefer a more independent companion, whereas keepers of dogs prefer a more sociable one. Another recent study by Wiggett-Barnard and Steel (2008) assessed the role of dogs in the life experiences of their human companions. Although many respondents responded that the dogs tended to increase the number of their social interactions, some acknowledged that the dog acted as a magnet, attracting some and polarizing others.

We conducted an additional analysis to further identify the role of “dog people” in reacting to the experimental conditions. Our hypothesis was that perhaps keepers of companion animals in general would not respond as well to the companion animal as keepers of dogs would. To explore this hypothesis, we created a new variable from the demographic data for participants who reported that they keep one or more dogs.

**Hypothesis 4.** There will be a significant three-way interaction among animal presence, task difficulty level, and dog guardianship on state anxiety. Specifically, the stress-reducing properties of the companion animal would only be observed under moderate task difficulty among participants who are keepers of dogs.

**Method**

**Participants**

Participants were recruited from undergraduate psychology classes at a large western university in the United States. The total number of participants was
A. Stewart, O. Strickland / Society & Animals 21 (2013) 249-265

128, who were primarily female (95 female, 33 male) and ranged in age from 18 to 57 years old, with a median age of 20.00 \( (M = 21.32, SD = 5.63) \). All participants were treated in accordance with APA ethical guidelines, and all participants received course credit for their participation.

**Materials**

**State-Trait Anxiety Inventory.** The State-Trait Anxiety Inventory (STAI) uses two four-point scales, one for state anxiety \( (1 = \text{not at all}; 4 = \text{very much so}) \) and one for trait anxiety \( (1 = \text{almost never}; 4 = \text{almost always}) \), to assess various statements about how the participants felt at that moment and generally. Scores range from 20 to 80 on each questionnaire, with lower scores indicating less anxiety and higher scores indicating more anxiety (Spielberger, 1983). This test has been shown to have a high correlation with measures of perceived stress (general and current test). The participants in this study had an average trait anxiety score \( (M = 38.71, SD = 8.53) \) that was very close to the norms presented in the STAI for college students \( (M = 38.30-40.40, SD = 9.18-10.15) \). The participants’ measures on the first administration of the state anxiety subscale \( (M = 37.33, SD = 9.26) \) were also very close to the norms presented in the STAI for state anxiety \( (M = 36.47-38.76, SD = 10.02-11.95) \).

**Tasks.** This study incorporated a set of three clerical tasks. The tasks were based on Monk and Conrad’s (1979) clerical tasks and included alphabetization, proofreading, and basic math. For the alphabetization task, participants were asked to read a list of names and mark those that were out of alphabetical order (p. 192). The study took names from two sections of the Sacramento phone book and introduced errors into the alphabetical order. The proofreading task was based on Monk and Conrad’s (1979) task of the same name. Monk and Conrad used a transcription of a 1500-word article from a science magazine and introduced inverted letters, missing spaces, or inversion of letter and space into the text every 75 words. The current study included an article about sloths, containing 655 words for the moderate difficulty level and 1,000 words for the extreme task-difficulty level. Four types of errors were introduced into the selection: inversion of two letters, missing spaces, inversion of a letter and a space, and common misspellings of words.

The math task was created to simulate the basic math skills required in an office job. Participants were given a list of fictional receipts for four or five employees and asked to add each employee’s receipts. Each list of numbers was created through a random number generator to include dollar amounts of 1-99. Each column had between four and six dollar amounts.
Companion Animal. The companion animal who participated as the research confederate was Siena, a 1.5-year-old female Labrador retriever who was being trained as an assistance animal for Canine Companions for Independence (CCI). The dog was friendly and calm in response to attention from strangers. Participation in this study was part of Siena’s training to interact in such a manner when in public.

The CCI program has strict guidelines about the safe treatment of their dogs in training. They may not be subject to neglect or any form of abuse. In addition to guidelines about their interactions with humans, they are also to be provided with adequate play, rest, and sustenance. In keeping with this program, Siena sat on her bed a few feet away from the participants’ work station. After a few sessions she was given a snack and a bathroom break.

Procedure

Participants were recruited through a psychology research website, where the project was identified as an assessment of clerical aptitude. Upon reporting to the first laboratory room, the participant read and signed a consent form, which was kept separate from the rest of his/her data. The participant received and completed the first state-anxiety subscale and the trait-anxiety subscale of the STAI. The researcher informed the participant that the rest of the study would be completed in another room. Before leaving the first laboratory room, the researcher informed participants in the animal-present condition: “I’m raising a dog for Canine Companions for Independence, and I didn’t have anywhere else to keep her today, so she’s in the other research room. It would be good training for her to meet strangers. Do you have any problem with having a dog in the room with us while you do the study?” The participants were given a chance to withdraw from the study at any time without penalization in order to avoid ethical issues with individuals who had an objection to interacting with a dog. No one withdrew from the study.

The researcher inconspicuously timed for one minute while “waiting” for another fictitious participant. This deception was used to give the participants in the animal-present condition an opportunity to interact with the dog. Many of the participants had questions about the CCI program; the researcher offered to answer them after the participant completed the experiment. Participants in the animal-absent condition had a one-minute rest period.

The researcher then informed the participant that they couldn’t wait any longer for the “other” participant and explained the tasks. The researcher placed the first task (alphabetization) facedown in front of the participant, set the timer for two and a half minutes, and told the participant to begin. When
the time limit was reached, the researcher removed the first task, placed the second task (proofreading) facedown in front of the participant, set the timer for five minutes, and told the participant to begin. When the time limit was reached, the researcher removed the second task, placed the third task (math) facedown in front of the participant, set the timer for five minutes, and told the participant to begin. When the time limit for the last task was reached, the researcher removed the third task and gave the participant the second state-anxiety subscale and a demographics questionnaire. The participant then received a debriefing notice explaining the purpose of the study. The researcher in the animal-present condition took this opportunity to answer any questions about the CCI program or Siena.

Results

Descriptive Analyses

Means and standard deviations of all study variables are presented in Table 1. Of the 128 participants, 75 identified themselves as companion-animal guardians, and 53 identified themselves as non-companion-animal guardians. Of the 75 companion-animal guardians, 29 (38.7%) said they keep one companion animal, 16 (21.3%) said they keep two companion animals, and 30 (40%) said they keep three or more companion animals ($M = 2.01, SD = 0.89$). Companion animal guardians said that, on average, they interact with their companion animals about three hours per day ($M = 2.89, SD = 2.53$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>$N$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of companion animals</td>
<td>2.01</td>
<td>0.89</td>
<td>75</td>
</tr>
<tr>
<td>Number of dogs</td>
<td>1.51</td>
<td>0.89</td>
<td>61</td>
</tr>
<tr>
<td>Hours of interaction with companion animal per day</td>
<td>2.89</td>
<td>2.53</td>
<td>75</td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>38.71</td>
<td>8.53</td>
<td>128</td>
</tr>
<tr>
<td>State anxiety at time 1</td>
<td>37.33</td>
<td>9.26</td>
<td>128</td>
</tr>
<tr>
<td>State anxiety at time 2</td>
<td>39.82</td>
<td>10.54</td>
<td>128</td>
</tr>
<tr>
<td>Percent correct for alphabetization task</td>
<td>57</td>
<td>.27</td>
<td>128</td>
</tr>
<tr>
<td>Percent correct for proofreading task</td>
<td>45</td>
<td>.19</td>
<td>128</td>
</tr>
<tr>
<td>Percent correct for math task</td>
<td>68</td>
<td>.28</td>
<td>128</td>
</tr>
</tbody>
</table>
Bivariate correlations among study variables are presented in Table 2. Consistent with previous research on the STAI, higher scores on state anxiety at time 1 correlated with higher scores on trait anxiety, $r = .65$, $P < .05$ and with higher scores on state anxiety at time 2, $r = .60$, $P < .05$. Higher scores on trait anxiety were also associated with higher scores on state anxiety at time 2, $r = .58$, $P < .05$.

**Tests of Hypotheses**

Due to the strong correlation between trait anxiety and state anxiety measures on the STAI, all hypotheses were tested using an ANCOVA that controlled for the effects of trait anxiety. The ANCOVA was conducted twice; one analysis included the general keeping of companion animals and another specified prior the keeping of a dog. Hypothesis one stated that there would be a significant main effect of animal presence on self-reported state anxiety. This hypothesis was not supported $F(1, 127) = .09$, $ns$.

It was also hypothesized that there would be a significant two-way interaction between animal presence and task-difficulty level on state anxiety. This
hypothesis was also not supported. When analyzing state anxiety at time 2 with trait anxiety covaried, there was not a significant two-way interaction $F(1, 119) = 1.06, ns$.

The other hypotheses included pet guardianship and its potentially interactive effects with companion-animal presence and task difficulty. Companion-animal guardianship was looked at in two different ways: whether the participant was a companion-animal guardian (of any type) and whether or not the participant specifically kept dogs. One reason for this additional analysis was to see whether a beneficial effect of nonhuman animals requires a participant status of “dog lover.”

**Pet-Guardian Status**

Results showed that, after covarying trait anxiety, there was a significant three-way interaction of companion animal, task difficulty, and pet guardianship status on state anxiety, $F(1, 120) = 6.17, P < .05$. The lowest average state anxiety score was among companion animal-keeping participants in the moderate task difficulty, animal-present condition ($M = 36.00, SD = 9.92, N = 17$). The highest average state anxiety occurred among non-companion-animal keeping participants in the extremely difficult task level, no animal-present condition ($M = 45.44, SD = 11.36, N = 9$).

**Table 3. State Anxiety Means by Animal Condition, Task Difficulty, and Companion-Animal Guardianship Status**

<table>
<thead>
<tr>
<th>Dog present in lab room</th>
<th>Dog absent from lab room</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Moderate difficulty tasks</strong></td>
<td><strong>Extreme difficulty tasks</strong></td>
</tr>
<tr>
<td>Companion animal guardian</td>
<td>Non-companion animal guardian</td>
</tr>
<tr>
<td>$M$</td>
<td>36.00</td>
</tr>
<tr>
<td>$SD$</td>
<td>9.92</td>
</tr>
<tr>
<td>$n$</td>
<td>17</td>
</tr>
</tbody>
</table>

**Dog-Keeping Status**

When repeating the analysis including dog-keeper status (rather than general companion-animal guardian), there was similarly an effect of the covariate trait anxiety, and a main effect of task difficulty $F(1, 119) = 5.59, P < .05$. In
addition, the three-way interaction was significant, $F(1, 119) = 4.98, P < .05$ (see Table 4). The lowest level of state anxiety at time 2 was reported by dog keepers in the animal-present, moderate task-difficulty condition ($M = 34.14, SD = 9.83$).

The highest level of state anxiety was reported by dog keepers in the animal-present, extreme task-difficulty condition ($M = 43.28, SD = 12.03$; see Table 4).

**Discussion**

*Main Purpose and Findings*

This study has documented that the stress-reducing effects of a companion animal in a simulated occupational setting are dependent on a number of factors. A main effect of animal presence in this short-term study was not sufficient to reduce stress among all participants. Companion animals may assist in stress relief for people in average-stress jobs who already have positive feelings toward companion animals but may have no effect for people in high-stress jobs or who do not already enjoy the company of nonhuman animals.

More specifically, the hypothesis that there would be a significant interaction between animal presence and task difficulty was not supported. This indicates that the mere presence of a companion animal was not sufficient to reduce stress for all participants under either moderate- or extreme-difficulty workloads. Generalized to a work setting, the results suggest that not every employee would benefit from the presence of a companion animal, regardless of their workloads.
In fact, prior companion-animal guardianship status was necessary to experience the stress-reducing effects of the companion animal. The lowest stress scores occurred in pet-keeping participants in the animal-present, moderate-difficulty condition. The highest level of state anxiety was reported by dog keepers in the animal-present, extreme task-difficulty condition. This pattern of results departs from the general companion-animal guardianship data. It is possible that the dog keepers in the animal-present, extreme-difficulty condition experienced an additional level of anxiety because they wanted to interact with the dog but were unable to because of task constraints. Future research should attempt to replicate this finding. Generalized to a work setting, the results suggest that current companion animal guardians who work in a moderately stressful situation would be most likely to benefit from the presence of a dog, while non-companion-animal guardians who work in a highly stressful setting would not benefit from the presence of a dog.

Strengths and Limitations

Most past research in this area has not incorporated tasks that simulated an average work environment. As mentioned earlier, Straatman et al. (1997) used the most feared activity (public speaking) as its stressor. The clerical tasks used in this study were derived from previous research and required basic office skills to complete. Although these tasks do not account for every work environment in the United States, they have face validity and thus may simulate a more accurate work environment than other researchers have created.

This study used the STAI to measure state and trait anxiety. The STAI is a reliable measure of trait anxiety and is sensitive to even small changes in state anxiety. The findings from this study can now be incorporated into the wealth of literature that has employed the STAI.

The use of a dog in training was necessary to accommodate the cover story of the “accidental” presence of Siena in the laboratory. Without this cover story, we would not have been able to employ a lab study that randomly assigned participants to condition. Siena was always wearing her official CCI cape when participants were introduced to her, and, although they were given permission by the researcher, some participants seemed reluctant to interact with her. The greater presence of service dogs in our society has created greater awareness that the public should not touch these working dogs. It is possible that some participants restricted their interaction with Siena because she was at the school in an official capacity, thereby limiting the possible stress-relieving effects. In fact, previous research (El-Alayli, Lystad, Webb, Hollingsworth, & Cioli, 2006) suggests that one’s own companion animal might be a preferable companion. These authors have demonstrated a “pet enhancement bias,” in
that participants rated their own companion animal more favorably than the average companion animal. Future research could help to determine the relative differences in effectiveness of a CCI dog versus a person’s companion dog.

This study was also limited by the short-term nature of a university laboratory study. Greater effects of animal presence may have been found if a long-term study were conducted in a real work environment. Previous research suggests that familiar animals or companion animals are particularly beneficial in stress measurements. Perhaps greater effects would be observed if participants developed a relationship with a dog at their work site over a period of time. Also, by drawing from a psychology undergraduate research pool, this study had a limited sample of participants in terms of age, education, and work experience. Although this limitation is inherent in university laboratory research, the extent to which it can be generalized to other settings is unknown.

**Directions for Future Research**

Future researchers should consider longitudinal, on-site research of animals in the workplace to decrease stress. This study used a friendly, unfamiliar dog as a companion animal. Changing the location and duration of a future study would also change many aspects of the human-animal interaction. The presence of a familiar, nonservice dog in a workplace may reduce participants’ fear of the social rule of noninteraction with service animals and increase the chances that participants would interact with the dog. Greater interaction with less fear/worry may potentially create greater stress reduction.

Along a similar line, some employees at work sites that already allow dogs have reported that their greatest stress relief is derived by taking the dog out for a walk or playing fetch. This study was limited in the type of interaction the participants could have with Siena. Not only were they limited by the physical size of a small laboratory room, but they were asked, for the purposes of her training, to not overexcite the dog while interacting. Different types of play may have resulted in greater stress relief, and future research should document the nature of on-site interactions with dogs that provide psychological benefits for their human companions.

A final area of consideration for future research concerns the effects of workplace attendance on the nonhuman animal. As noted by Shore, Douglas, and Riley (2005), most research investigating the human-animal bond has tended to focus on the benefits to humans, without adequate consideration of the effects on the nonhuman animals. These authors developed a measure of the benefits to dogs, including: food, shelter, health care,
stimulation/play, contact with humans, safety, and freedom from abuse. These authors compared level of care (essential, standard, enriched, and luxury) as a function of attachment to the animal. They found that essential care benefits were provided regardless of attachment, but that the other categories tended to increase as attachment increased. Sable (1995) discussed how attachment functions from an animal’s perspective. This author explains that nonhuman animals need attachment for protection and survival, and they are negatively affected by separation from their attachment figures. This author concludes that disrupting a pet’s attachment to a human is cruel to the animal. For cases in which the guardian of a companion animal works outside the home for eight or more hours per day, the attachment to the nonhuman animal may be disrupted, particularly for animals who would be left alone.

The studies reviewed thus far suggest potential benefits for an animal to be included “at work.” However, some research suggests that dogs who work in a therapeutic capacity actually experience increased stress as a result of their involvement with humans (e.g., Haubenhofer & Kirchengast, 2007). These authors investigated therapy dogs’ reactions to their work environments to examine whether there were any behavioral or physiological indicators of stress. To accomplish this goal, they measured the dog handler’s assessments of the dogs’ experience as well as the dogs’ cortisol levels. They observed some positive effects of animal-assisted therapy (e.g., the handlers rated them as “satisfied” after therapy), but also an increase in overall cortisol levels for the dogs. This evidence suggests that the therapy sessions can, in fact, be a stressor for dogs. Future research is needed to clarify the working conditions that would be beneficial to nonhuman animals as well as their human counterparts.

This study has advanced the research regarding some of the variables involved with a companion animal. More specifically, it may have shed some light on the limited effects of the companion animals in the Havener et al. (2001) study, as well as the Straatman et al. (1991) study. These findings could be reexamined in light of whether or not the participants were dog-oriented, and whether the task demands may have overridden their natural affiliation toward the animal. This study has provided a foundation demonstrating that a companion animal decreased self-reported state anxiety for some people under certain conditions. Future researchers should use this experiment as a stepping stone to create more applicable studies that will, we hope, lead to greater understanding of the potential benefits of nonhuman animals in the workplace.
References


