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Study of the Effect of Dogs on College Students' Mood and Anxiety

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A STUDY OF THE EFFECT OF DOGS ON COLLEGE STUDENTS' MOOD
AND ANXIETY

By

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A Thesis Submitted in Partial Fulfillment
Of the Requirements for a Degree with Honors
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Abstract

The purpose of the present study was to determine whether first-year college students' interaction with a dog would have a positive effect on their mood and anxiety. A sample of 35 first-year college students, aged 18-19 years, was partially randomly assigned to a condition for five minutes in which the participant either interacted with a dog (n = 19) or watched an informational video that included dogs (n = 16). Before the experimental treatment, students completed the Pet Attitude Scale, Positive and Negative Affect Schedule-Expanded Form, State-Trait Anxiety Inventory, and the Perceived Stress Reactivity Scale to evaluate their animal preferences, mood, anxiety, and stress. After the experimental treatment, participants again completed the Positive and Negative Affect Schedule-Expanded Form and State-Trait Anxiety Inventory to assess for possible changes in mood and anxiety. Results indicated that those who directly interacted with the dog reported increases in positive mood, but those who just watched dogs did not. All participants, regardless of condition, experienced declines in negative mood and anxiety across time. Thus, there appear to be some benefits to interacting with dogs, specifically regarding improvements in positive mood. Further studies, especially those with larger sample sizes and that take place during times of elevated stress are needed in order to more fully examine the potential for positive effects of dog interactions on college students.

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The Effect of Dogs on College Students' Mood and Anxiety

Mood, stress, and anxiety are important in daily human function. Mood potentially has a serious impact on learning, memory, decision-making, and allied cognitive processes (Forgas & Eich, 2013), and stress can have a negative impact on health and well-being (Gartland, O'Connor, Lawton, & Ferguson, 2014). One person's mood and anxiety can also positively or negatively affect the people around him or her. Many households have grown up with pets, particularly dogs. Having a pet has been claimed to have beneficial health effects (Rijken & Beek, 2011) and evidence shows dogs can affect people in a positive way. Gaining a positive mood, and decreasing anxiety because of dogs could show people that it can be a positive influence to have responsibility over a dog. Likewise, just being in the same environment as a dog may help, too. While there is evidence that dogs can affect people in a positive way, having a canine in one's presence may improve social skills, health, and emotions, as well (Allen, Blascovich, & Mendes, 2002; Kotrschal & Ortbauer, 2003; Marcus, Bernstein, Constantin, Kunkel, Breuer, & Hanlon, 2012). Overall, a broad spectrum of research shows the beneficial influence of dogs.

As mentioned before, mood can impact individual's quality of life. There have been many studies that investigated mood as one of the dependent variables. Marcus et al. (2012) found that there were benefits within participants' mood from therapy dog visits. In their study, participants were a large sample of mixed chronic pain patients that either spent clinic-waiting time with a therapy dog, or waited in the outpatient waiting area before their appointments. Those who spent time with a therapy dog saw changes in positive feelings, including high self-perceptions of calm, pleasantness, and cheerfulness

(Marcus et al., 2012). Marcus, Bernstein, Constantin, Kunkel, Breuer, and Hanlon (2013) later expanded on this research, and found that significant improvements were reported for mood, pain, and other measures of distress among patients with Fibromyalgia after a therapy dog visit. A separate study observed that children exhibited a more playful mood when they were in the presence of a therapy dog (Berry, Borgi, Francia, Alleva, & Cirulli, 2013). Mood does not only affect our emotions, it also affects the way we perceive others around us. Hergovich, Monshi, Semmler, and Zieglmayer (2002) found that when first-graders had a dog present in the classroom, they were able to segregate self/non-self and show greater sensitivity to the moods of others. These first-graders were showing empathy.

As mentioned with mood, anxiety can also influence every individuals' daily functioning. In research conducted by Barker et al. (2010), anxiety was measured as a related component to stress. Their research found that dog owners perceived less anxiety and stress when interacting with their own dog than when interacting with an unfamiliar dog. In another study, anxiety reduction was observed after a therapy dog intervention for patients with psychotic disorders or other psychiatric conditions (Marcus et al., 2012). Marcus et al. (2013) reported that anxiety among adults waiting for a magnetic resonance imaging was significantly reduced after spending 15 minutes with a therapy dog. Anxiety also decreased among children with autism spectrum disorders when an assistance dog was integrated into the family (Berry et al., 2013). Another study included elementary-aged students with emotional behavioral disabilities that may have struggled with anxiety (Bassette & Taber-Doughty, 2013). These students experienced

improvements over time while reading aloud to a therapy dog. These improvements included alleviating anxiety during reading.

Many studies have focused on mood and anxiety as variables within their experiments. The current research study focused on what effects dogs have on first-year college students' mood and anxiety. To date, there has been limited research on this particular demographic. Barker, Knisely, McCain, Schubert, and Pandurangi (2010) stated that pet ownership is associated with reduced stress, where pets may act as a buffer during stressful events. In one study involving college students, the research found that immediately after holding a canine or feline, participants' diastolic blood pressure significantly decreased (Somerville, Kruglikova, Robertson, Hanson, & MacLin, 2008). They did not find significant gender differences in the effects of dogs, although females generally had a lower blood pressure than males. However, the results of the Somerville et al. (2008) study only partially supported previous findings with animal contact and blood pressure. With this understanding, there could be a difference between owning a pet and just visiting one. While research has been conducted using a variety of age groups, most of the previous studies of the effects of dogs on people have tended to focus either on the elderly or on elementary school-aged children. This is the case because as Hergovich et al. (2002) state, children and older people do seem to profit the most from interacting with animals.

Interactions with Dogs and the Adjustment of the Elderly

The results of research examining the effects of dogs on the adjustment of the elderly have been mixed. For example, in one study, elderly that received weekly dog visits from therapy dogs for six weeks did not improve on depression scores, mood, or

social interaction (Phelps, Miltenberger, Jens, & Wadson, 2008). However, there was one resident out of the five participating that had persistently higher positive mood scores immediately after the dog visits compared to baseline and days when there were no visits (Phelps et al., 2008). Even though most of the residents did not gain beneficial effects, all of the participants enjoyed the visits. Nevertheless, this study did show that having a dog increased the likelihood of being active, unlike for the elderly with felines. In one study that focused on incorporating the participant's own pet dog, Rijken and Beek (2011) investigated the effects on the elderly, aged 65 and older, of owning pets. They found that dogs could be considered social facilitators, because when dog owners meet each other they can talk about their pets and extend their social network with people who share their same interests. However, these researchers did not find evidence that having a pet at home is beneficial to their perceived health of the elderly (Rijken & Beek, 2011). Siegel (1990) reported that pet owners who were 65 and older, more specifically dog owners, reported fewer doctor contacts compared to those without pets. Siegel (1990) stated that owning a dog provided a stress buffer for the elderly compared to elderly that did not own pets. This investigation also revealed that dog owners, unlike owners of other pets, spent more time outdoors, felt more attached to their pets, felt more secure because of their pets, and thought that their dogs provided more companionship.

Interactions with Dogs and the Adjustment of Children

Research concerning elementary school children has examined children with autism, children within their school environment, and children that have emotional and behavioral disabilities (Bassette & Taber-Doughty, 2013; Berry et al., 2013; Fung & Leung, 2014; Kotrschal & Ortbauer, 2003). Dogs were chosen in these studies because

their popularity and interactive nature make them more likely than other animals to have an impact on children (Hergovich et al., 2002). In one study focusing on autistic children, an “animal-assisted play therapy intervention” was implemented. Fung and Leung (2014) found small but significant increases in children’s verbal social behavior, compared to an identical play therapy procedure that replaced the therapy dog with a doll. Kotrschal and Ortbauer (2003) observed that having a dog in an elementary school classroom helped the children become more socially homogenous by decreasing behavioral extremes such as aggressiveness and hyper-activity. Two out of the three dogs were certified therapy dogs. In another investigation focusing on children within the classroom, Hergovich et al. (2002) used three dogs so as to give each dog periodic breaks. Two out of the three dogs were trained therapy dogs. Hergovich et al. (2002) found that a dog’s presence is important for the social and cognitive development of young immigrant children, who have problems understanding a new language and starting school.

Interactions with Dogs and the Adjustment of the Adults

Even though the majority of research in this field has focused on the elderly and children, there are some studies that focus on other demographics. One investigation compared adult women, ranging from 27 to 55 years, within their own homes with either their own pet dog in the same room, a close friend in the same room, or neither as the control group (Allen, Blascovich, Tomaka, & Kelsey, 1991). The results of this study demonstrated that during the performance of a stressful task, the presence of pet dogs provided a nonevaluative social support system compared to those who were with a close friend when they completed the task. The presence of pets may induce positive feelings

that are not evoked by one's close friends during a stressful task (Allen et al., 1991). Instead of just focusing on women, another study examined married couples, with a mean age of 41, where half owned a single pet and the other half had no pets (Allen et al., 2002). Couples with pets had significantly lower heart rate and blood pressure during baseline, and faster recovery following stress (Allen et al., 2002). People perceive pets as important parts of their lives. Allen et al. (2002) stated that because of these perceptions there are significant cardiovascular and behavioral benefits. In addition, research has examined therapy dog owners (Barker et al., 2010). The two groups of participants in this study included therapy dog owners with their own dog and therapy dog owners with an unfamiliar dog. Barker et al. (2010) found a trend of relaxation associated with interacting with any therapy dog. They also observed that the dog owners with their own dog had perceived less stress and anxiety compared to the dog owners interacting with an unfamiliar dog. This study shows the benefits from your own pet dog compared to an unfamiliar dog.

Transition to College

The number of studies that have focused on the young children and elderly age groups can be viewed as transitions in life. Similarly, college students experience a major lifestyle transition that can be stressful, yet liberating. Transitioning into college can produce many stresses related to a new environment, academic demands, social demands, and separation from family. Transitioning from late adolescence into emerging adulthood is a key developmental period marked by changing roles, new challenges, and increased responsibilities (Conley, Kirsch, Dickson, & Bryant, 2014). Conley et al. (2014) conducted a study looking at the transition throughout the first year of college.

Results indicated that in the first year, particularly within the first few months, students experience significant declines in psychological well-being, cognitive-affective strengths, and social well-being as well as significant increases in psychological distress and cognitive-affective vulnerabilities. Conley et al. (2014) also found that these disturbances generally plateaued, rather than worsened or rebounded, during the second semester.

Stress in college students has been prevalent. One study was examined the stresses that come from transitioning into college. Brougham, Zail, Mendoza, and Miller (2009) researched the sources of stress and coping strategies of college students. Sources of stress include academics, financial, family, social, and daily hassles (such as trying to find a parking spot and worrying about being late for class). The coping strategies included self-help, approach, accommodation, avoidance, and self-punishment. Brougham et al. (2009) found that college students that were women reported higher overall levels of stress, greater stress from family, social relationships and daily hassles, and a greater overall use of self-help and approach to cope with stress. College women also reported greater stress about finances and use of self-punishment for coping compared to college men. Furthermore, Brougham et al. (2009) found that college men reported using emotion-focused coping for a greater number of specific stressors. With these findings, Brougham et al. (2009) concluded that freshmen and sophomores reported greater stress than juniors and seniors.

The transition into college can be stressful, and as a result this population is particularly vulnerable to developing or exacerbating depressive symptoms (Lee, Dickson, Conley, & Holmbeck, 2014). Depressive symptoms can impact the overall

quality of life. Given that anxiety, stress, and depressive symptoms can be related, it is important to find ways that college students can cope with these daily occurrences. One way that may help is interacting with animals, specifically dogs. As Somerville et al. (2008) stated, college students may not be generalized to other age groups or non-college settings such as nursing homes and hospitals. Analyzing college student-canine interactions is a novel way of studying canines' influence on people, as there are few studies involving this interaction.

The Present Study

Much of the research examining the role dogs may play in the psychological and health functioning of humans has involved children and the elderly, even though there have been some studies that have included the adult demographic. In addition, many of these studies have focused on individuals who have disorders or disabilities such as autism spectrum disorders, and emotional and behavioral disabilities (e.g., Bassette & Taber-Doughty, 2013; Berry et al., 2013; Fung & Leung, 2014). Furthermore, the majority of investigations have focused on the implementation of certified therapy dogs within the experimental groups, rather than the typical house-trained dog (e.g., Bassette & Taber-Doughty, 2013; Berry et al., 2013; Fung & Leung, 2014). Given these limitations in the existing research, the purpose of the present study was to extend current research, while addressing some limitations of the existing work. This study involved college-aged participants interacting with a house-trained 10-month-old Yellow Labrador Retriever that they were unfamiliar with. This specific breed of dog was chosen for this study because it is a popular standard breed that many can relate to. Another reason for a

house-trained dog was to get the most realistic results as possible. Meeting a therapy dog on the side of the road is not as likely as meeting a house-trained dog.

To examine whether interaction with a dog might impact college students' mood and anxiety levels, an experimental study was conducted. Briefly, a participant was partially randomly assigned to a condition in which either the student interacted with a dog for five minutes or watched an informational video that included dogs for five minutes. Stress was measured before the dog-related task as a correlate to mood and anxiety. Mood and anxiety were measured as a pretest/posttest for this experiment. It was hypothesized that the physical interaction with a dog would have a significant positive effect on college students' mood and anxiety levels, compared to the control group that watched an informational video. If this is the case, then students can be informed of one strategy that can help them during college's stressful moments. This project is personally interesting because I have always been fascinated by the human-animal dynamic. Knowing whether dogs can have an affect on our health, mood, and anxiety can help us with life's daily stresses.

Methods

Participants

Participants in this study were 35 first-year undergraduate students (12 male and 23 female) who were attending the University of Maine in Orono. Their age range was from 18 to 19 years old. Students were recruited through a posting on the subject pool website Sona, and they were awarded one credit once they completed the experiment. Participants were screened for allergies towards dogs within the Sona Study Summary (see Appendix A).

Measures

Demographic survey. Participants were asked to provide some demographic information that consisted of 10 questions including age, gender, ethnicity, relationship status, if they have a pet dog and how much contact do they have with the dog, and if they consider themselves as a dog person or a cat person (see Appendix C).

Pet Attitude Scale (PAS). This measure included 18 statements rated on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*) (Templer, Salter, Dickey, Baldwin, & Veleber, 1981). Participants were asked to rate certain statements such as “I would like a pet in my home” or “House pets add happiness to my life (or would if I had one).” (see Appendix D).

Positive and Negative Affect Schedule-Expanded Form (PANAS-X). This measure involved 60 words and phrases that described different feelings and emotions on a 1 (*very slightly or not at all*) to 5 (*extremely*) Likert Scale (Watson & Clark, 1994). Participants indicated how much they felt certain emotions; such as how cheerful or sad they felt in the moment (see Appendix E).

State-Trait Anxiety Inventory (STAI). This measure included six statements that were rated on a 1 (*not at all*) to 4 (*very much*) Likert Scale (Marteau & Bekker, 1992). Participants reported how they felt in the moment, involving statements such as “I feel calm” or “I feel upset” (see Appendix F).

Perceived Stress Reactivity Scale (PSRS). This measure consisted of 23 statements involving different reactions to stress. The PSRS included statements such as “When I want to relax after a hard day at work...” (Schlotz, Yim, Zoccola, Jansen, & Schulz, 2011). The participants then selected the best response that described their own

present reaction on a scale of 1 to 5 such as “This is very difficult for me” to “I generally have no problem at all” (see Appendix G).

Procedure

Participants were partially randomly assigned to one of two groups, experimental or control. Participants chose what timeslot they wanted, but the random assignment was implemented through each of the two conditions being held on different days unbeknownst to the participants. Two weekends were dedicated to participants coming in. For the first weekend Saturday was dedicated to the control group and Sunday was dedicated to the experimental group, and so the second weekend was reversed. When participants came in for their timeslot they filled out the consent form (see Appendix B), demographics, PAS, PANAS-X, STAI, and PSRS before the experiment was conducted.

Experimental group. Those in the experimental group ($n = 20$) played with the dog for five minutes. Before introducing the participants to the dog, an Introduction Script (see Appendix H) was read in order to make sure the participants were okay with interacting with a dog. The dog that participated in the experiment was a 10-month-old Yellow Labrador Retriever. This dog was hyper on occasion, exhibiting energy and eagerness to meet the participants. Participants were allowed to freely play with the dog, including petting her, talking to her, and throwing tennis balls or a squeaky toy around in an unstructured way. The few times that she was less energetic, participants would sit with her on the ground and pet her or rub her belly. Some participants were more energetic than others and would run around the room with her.

Control group. Those in the control group ($n = 16$) watched five minutes of an informational video from YouTube called, “Using Dogs to Show Examples of Classical

and Operant Conditioning.” This video showcased Dr. Kathy Gerbasi teaching her class about classical and operant conditioning using her dogs. Before watching this video, the same Introduction Script used for the Experimental Group was presented to the participants, with the appropriate adjustments to reflect the activity in which these participants were going to engage.

After finishing the dog-related activity, all participants completed the posttest surveys (PANAS-X and STAI) to determine if there were any mood changes and anxiety changes compared to the pretest surveys. At the conclusion of each session a Debriefing Statement was read to the participants (see Appendix I). Each session lasted approximately twenty to twenty-five minutes, including time to complete established measures.

Results

Data were analyzed to investigate the hypothesis that direct interaction with a dog would lead to college students experiencing improvements in mood and reductions in anxiety, whereas just observing dogs would not contribute to changes in mood or anxiety. First, groups were examined to establish that participants did not differ in their attitudes toward pets or in the stress reactivity. Then, results regarding mood and anxiety were explored as a function of group and time (before and after exposure to dogs).

Pet Attitude Analyses

Analyses were conducted to explore whether pet attitude scores significantly differed for control versus dog condition participants. Total scores were used to report the total mean scores. There was not a statistically significant difference in pet attitude scores between conditions (Experimental Group $M= 108.42$; Control Group $M = 105.47$),

$t(30.734) = .749, p = .46$. Thus, participants in each group overall had similar attitudes towards pets.

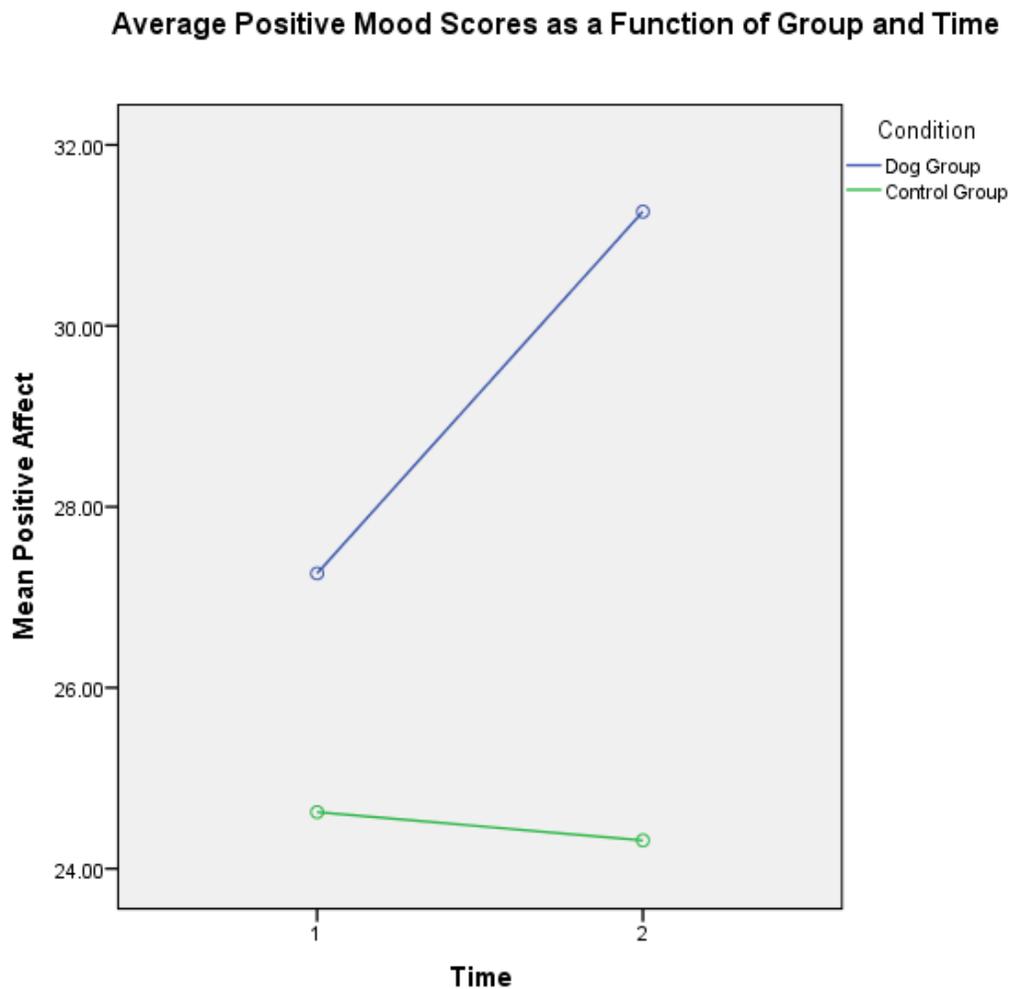
Perceived Stress Analyses

Analyses were performed to examine whether perceived stress reactivity scores significantly differed for control versus dog condition participants. Total scores were used to report the total mean scores. There was not a statistically significant difference in perceived stress reactivity scores between conditions (Experimental Group $M = 72.42$; Control Group $M = 66.88$), $t(29.8) = 1.404, p = .171$. Therefore, participants in each group exhibited similar levels of stress reactivity.

Mood Analyses

To determine whether there were changes in participants' mood after directly interacting with or just observing dogs, a 2 condition (control and dog) X 2 time (Time 1 and Time 2) repeated-measures ANOVA on positive affect was performed. There was a marginally significant main effect for condition ($F(1, 33) = 2.925, p = .097$). Specifically, participants in the dog condition (Before $M = 27.26$, After $M = 31.26$) reported having higher positive affect than the control group (Before $M = 24.63$, After $M = 24.31$). There was a marginally significant main effect for time ($F(1, 33) = 3.808, p = .06$). Specifically, participants reported having higher positive affect at Time 2 ($M = 28.09$) than at Time 1 ($M = 26.06$). However, these marginally significant main effects were qualified by a significant interaction of time and condition ($F(1, 33) = 5.209, p = .029$). As can be seen in Figure 1, participants in the dog condition experienced a significant increase in positive affect following their interaction with the dog. However, participants in the control condition did not exhibit an improvement in positive affect.

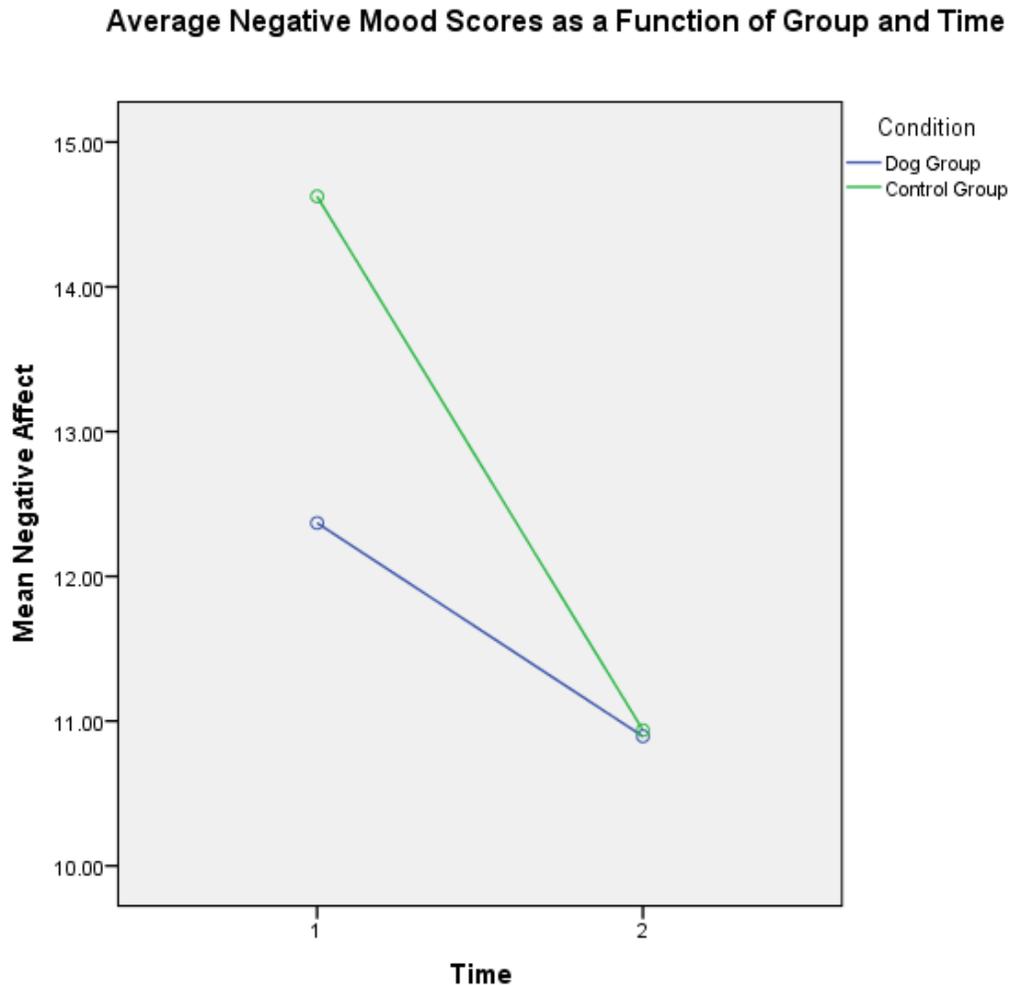
Figure 1



A 2 condition (control and dog) X 2 time (Time 1 and Time 2) repeated-measures ANOVA conducted on negative affect was also performed. There was no main effect for condition ($F(1,33)=1.792, p=.19$). Specifically, participants in the dog condition (Before $M = 12.37$, After $M=10.89$) did not report having lower negative affect than the control group (Before $M = 14.63$, After $M=10.94$). However, there was a main effect for time ($F(1,33)=17.19, p=.00$). Particularly, participants reported having lower negative affect at Time 2 ($M = 10.91$) than at Time 1 ($M = 13.40$). There was a marginally significant interaction for time and condition ($F(1,33)= 3.163, p=.085$). As can be seen in Figure 2,

participants experienced a significant decrease in negative affect following their exposure to dogs, whether they directly interacted with a dog or simply observed dogs on a video.

Figure 2



Anxiety Analyses

Finally, a 2 condition (control and dog) X 2 time (Time 1 and Time 2) repeated-measures ANOVA on anxiety was performed. There was no main effect for condition ($F(1,33)=2.604, p=.116$). Specifically, participants in the dog condition (Before $M = 8.53$, After $M= 7.05$) did not report having lower anxiety than the control group (Before $M = 9.69$, After $M= 8.19$). There was a main effect for time ($F(1,33)=18.811, p=.00$).

Particularly, participants reported having lower anxiety at Time 2 ($M = 7.57$) than at Time 1 ($M = 9.06$). There was no significant interaction for time and condition ($F(1,33)=.001, p=.97$). Specifically, participants in the dog condition and control condition did not experience a significant decrease in anxiety following their interactions.

Discussion

The purpose of the present study was to determine whether first-year college students' positive mood, negative mood, and anxiety would be positively affected after playing with a dog. Past research has focused primarily on the elderly or elementary-aged children, because these age groups do seem to profit the most from interacting with animals (Hergovich et al., 2002). Because research has tended to focus on these demographics, there is limited research done on the college student population. This study attempted to fill some of this gap, specifically in terms of the possible role of interactions with dogs influencing mood and anxiety, which in turn have been shown to impact the quality of life (Allen et al., 2002; Kotrschal & Ortbauer, 2003; Marcus et al., 2012).

Positive Mood

It was hypothesized that compared to the control group, those first-year college students that interacted with the dog would show an improvement in their positive affect scores after they played with the dog. In the present study, this hypothesis was supported, because only those in the dog condition showed a significant increase in positive affect over time. Those participants who simply observed dogs in a video did not show an improvement in positive affect. Because the control group's positive mood very slightly decreased after the treatment, this leads to the assumption that there were no

other factors influencing this scale. Thus, it appears that the treatment did have an effect on the positive mood of the students.

As described previously, the study conducted by Marcus et al. (2012) found that chronic pain patients that spent time with a therapy dog experienced changes in positive feelings, including high self-perceptions of calmness, pleasantness, and cheerfulness. It appears that similar effects occurred for the positive mood of college students, in this case, following their interaction with a non-therapy dog.

Negative Mood

It was predicted that compared to the control group, those first-year college students that interacted with the dog would show an improvement in their negative affect scores after they played with the dog. It was expected that along with increasing positive mood after the dog interaction, negative mood would decrease. However, in the present study, no effect of condition was obtained. Although there were no condition effects on negative mood, there was a main effect of time. Specifically, both the dog group and control group decreased their negative mood from Time 1 to Time 2. The main effect for time was likely due to all of the participants becoming more comfortable with their environment and perhaps feeling more relaxed as time progressed.

Although there were no condition effects on negative mood in the present study, there was a marginally significant interaction between condition and time. Specifically, the control group had a greater negative mood score at Time 1 and decreased in negative mood more than the dog condition participants by Time 2. It is unclear, however, why the control group had a more negative mood initially than the dog group.

Anxiety

It was hypothesized that compared to the control group, those first-year college students that interacted with the dog would show an improvement in their anxiety scores after they played with the dog. However, in the present study, no interaction between time and condition was found. Thus, it appears that the treatment did not have any effect on the anxiety levels of the first-year college students. This result seems to agree with the research findings of Barker et al. (2010), in which it was found that dog owners perceived less anxiety and stress when interacting with their own dog than when interacting with an unfamiliar dog.

In terms of time, however, there was a main effect. Thus, it seems that all participants were less anxious at Time 2 compared to Time 1. Perhaps participants were less anxious after settling in and completely understanding what they had to do for the experiment. One aspect that could have contributed to the participants' anxiousness could include that there were a few comments about how they were uncertain of the exact location of the experimental session, and some students arrived looking hesitant.

Linkage to Previous Research Findings

Although in the present study the only significant effects were within positive mood, this does fall in line with previous studies done on dog therapy. For instance, Marcus et al. (2013) found significant improvements were reported for mood among patients after a therapy dog visit. A separate study performed by Berry et al. (2013) revealed that children exhibited a more playful mood when they were in the presence of a therapy dog.

Besides positive mood significantly improving after the interaction with a dog, negative mood and anxiety did show an effect due to time. In one study performed by Marcus et al. (2012) anxiety reduction was observed after a therapy dog intervention. Marcus et al. (2013) later found improvements were reported for mood, pain, and other measures of distress after spending 15 minutes with a therapy dog. Bassette and Taber-Doughty (2013) reported that elementary-aged students experienced improvements over time while reading aloud to a therapy dog. While the results of these studies indicated that the decrease in anxiety that was found was linked to the treatment, it does support the idea that anxiety and negative mood can decrease over time.

Limitations

A major limitation of the present study was the small sample size. Because there were only 35 participants in total, and thus only 19 students in the dog group and 16 students within the control group, this made it difficult to detect effects that might be related to changes in mood and anxiety. Another limitation involves ethnicity. The sample consisted of almost all white students, with only two Hispanic students, one African American student, and one Middle Eastern student. Because of this, it is difficult to generalize the results to other populations. In addition, there was a higher proportion of females (23 participants) than males (12 participants). This makes it somewhat difficult to generalize the results to the male population. There were 51 slots open for participants to come in, and participants did sign up for all of the slots, but just about all of those that did not show up either cancelled the day of or just simply forgot. The timeslots were on Saturdays and Sundays, and so students may not have felt as obligated

to attend as during a weekday. Also, only students who were available on weekends were able to participate in this study.

Another limitation is that some participants may have known before the experiment what the procedure actually involved. Although there was a debriefing statement that requested that participants not share the details of the study with others, it is still possible that some participants did share information with their friends. There is not complete control of what participants say once they leave the room. An aspect that may have affected the results was that not everyone considered himself or herself a “dog person.” Out of the 35 participants, six considered themselves a “cat person,” and three did not consider themselves either a “dog person” or “cat person.” The effects of the dog interaction condition may have been stronger if all participants considered themselves at least a “dog person.” Only those who enjoy dogs are likely to experience reductions in stress, anxiety, and bad mood after interacting with a dog. Indeed, those who do not like dogs may find the experience aversive and may instead experience increases in stress, anxiety, and bad mood.

It should be taken into consideration that this experiment was conducted in the month of February. There may have been more significant results if this experiment took place at the beginning or end of the first semester, when transitioning into college is still completely new. The month of February does not include midterms or final exams and so participants’ mood and anxiety may be on a better level at that point.

An additional limitation of the study was that a certified person did not conduct the experiments; instead, an undergraduate student conducted the experiments. The

margin of error is greater with someone not trained on how to implement the experiments, and so this could have affected the results.

Summary, Future Directions, and Implications

The original hypothesis of this study was that following direct interaction with a dog, college students would show increases in their positive mood and decreases in their negative mood and anxiety. Consistent with this prediction, it was found that students' positive mood increased, but only for those who directly interacted with a dog. Although it was found that participants' negative mood and anxiety decreased over time, these changes were not specifically related to the dog condition. Therefore, the hypothesis of the study was only partially upheld. This is likely due to the small size of the sample. In order to better understand the effects that dogs have on college students, future research should be performed with larger sample sizes. Furthermore, future research should be careful to assure that females and males are equally represented. In addition, future research should include only those who appreciate dogs, as these individuals may experience the greatest benefit from their time directly interacting with a dog. Ideally, future research should take place at the beginning or end of the first semester of college as to compare times of elevated stress, especially for first-year students, and include someone with more experience at conducting the experiments. Along with self-report measures, future research would also benefit from including physiological measures, such as blood pressure and cortisol levels to assess changes.

Based on the present study's results, it does appear that direct interaction with dogs can be effective in increasing students' positive moods. Interaction with dogs is a fairly low-cost intervention that could have great benefits for both dog owners and those

that simply visit dogs. Many colleges, including the University of Maine, do have therapy dogs visit campus at specific times of elevated stress, such as during finals week or following a disaster. However, to the best of my knowledge, this is the first study that has provided empirical evidence that direct interaction with a dog does have at least some benefits for college students.

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Appendix A

Institutional Review Board for the Protection of Human Subjects Approval

Office of the Vice President
For Research
*Protection of Human Subjects
Review Board*



114 Alumni Hall
Orono, Maine 04469-5703
Tel: 207-581-1498
Fax: 207-581-1300
www.umaine.edu

MEMORANDUM

TO: Mariah Picard

FROM: Gayle Jones
Assistant to the Institutional Review Board for the Protection of Human Subjects (IRB)

SUBJECT: "The Effect of Dogs on College Students' Mood and Anxiety," #2014-12-04

DATE: January 2, 2015

The above referenced project was approved by the University of Maine's Institutional Review Board for the Protection of Human Subjects (IRB) in an expedited review. The approval period is 12/18/2014 through 12/17/2015. A continuing review of this project must be conducted by the IRB before the end of the approval period. Although you will receive a request for this information approximately 6-8 weeks before that date, it is your responsibility to submit the information in sufficient time to allow for review before the approval period expires.

Enclosed is an approved copy of the consent document for this project. The approval for this consent expires on 12/17/2015. **This approved copy must be duplicated and used when enrolling subjects during the approval period.**

Please remember that each subject must be given a copy of the consent document. Any unanticipated problems or harm to the subject must be reported to the IRB immediately. Any proposed changes to the research must be approved by the IRB **prior** to implementation. Any significant new findings must be reported to the subject.

If you have questions, please contact me at 1-1498. Thank you.

pc: Cynthia Erdley

Maine's Land Grant and Sea Grant University
A Member of the University of Maine System

APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
Protection of Human Subjects Review Board, 114 Alumni Hall, 581-1498

PRINCIPAL INVESTIGATOR: Mariah Picard
EMAIL: mariah.picard@maine.edu TELEPHONE: 207-205-5775
CO-INVESTIGATOR(S):
FACULTY SPONSOR (Required if PI is a student): Cynthia Erdley
TITLE OF PROJECT: The Effect of Dogs on College Students' Mood and Anxiety
START DATE: January 2015 PI DEPARTMENT: Psychology
MAILING ADDRESS: 2 Timberview Dr. Apt. 2G Orono, ME
FUNDING AGENCY (if any):
STATUS OF PI:
FACULTY/STAFF/GRADUATE/UNDERGRADUATE UNDERGRADUATE

- 1. If PI is a student, is this research to be performed:
 for an honors thesis/senior thesis/capstone? for a master's thesis?
 for a doctoral dissertation? for a course project?
 other (specify)
- 2. Does this application modify a previously approved project? N. If yes, please give assigned number (if known) of previously approved project:
- 3. Is an expedited review requested? Y

SIGNATURES: All procedures performed under the project will be conducted by individuals qualified and legally entitled to do so. No deviation from the approved protocol will be undertaken without prior approval of the IRB.

Faculty Sponsors are responsible for oversight of research conducted by their students. By signing this application page, the Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine's Policies and Procedures for the Protection of Human Subjects of Research.

11/7/14 _____
Date Mariah Picard
Principal Investigator

_____ *per email*
Cynthia Erdley
Faculty Sponsor

Co-Investigator

Co-Investigator

FOR IRB USE ONLY Application # 2014-12-04 Date received 12/16/14 Review (F/E): E
Expedited Category: LL39

ACTION TAKEN:

- ___ Judged Exempt; category ____ . Modifications required? ____ (Y/N) Accepted (date) _____
- ___ Approved as submitted. Date of next review: by ____ . Degree of Risk: _____
- Approved pending modifications. Date of next review: by 12/17/15 . Degree of Risk: minimal
Modifications accepted (date): 12/23/14 .
- ___ Not approved. (See attached statement.)
- ___ Judged not research with human subjects

Date: 12/18/14

Chair's Signature: Shawn Eel

Appendix B
Sona Study Summary

Earn 1 research credit while participating in a short activity! This study will be looking at what kind of an effect certain activities have on a student's mood and stress. You must be a first year student, have no allergies to dogs, and be 18 or 19 years old to participate in this study. If you are interested, you will pick out an appointment time to come in. The study should take approximately thirty minutes to complete.

Appendix C Informed Consent

The Effects of Activities on College Students Consent Form

You are invited to participate in a research project being conducted by Mariah Picard, an undergraduate student in the Department of Psychology at the University of Maine. The faculty advisor for this project is Cynthia Erdley, Ph. D., a professor in the psychology department. The purpose of this study is to better understand the effects of certain activities on college students as they adjust to college. You are invited to participate in this study because you are 18 or 19 years of age and are a first-year student at the University of Maine, currently enrolled in an undergraduate psychology course. Also, to participate in this study, it is important that you are not allergic to dogs. Your participation in this study will help further the understanding of the effects of activities on college students with regard to mood and stress.

What will you be asked to do during this study?

- After reading this form and indicating that you agree to participate in this study, you will be asked to complete several questionnaires before and after the activity. The questionnaires will ask you a variety of questions about your mood, anxiety, stress, and attitude towards animals, as well as general demographic information. Mood surveys will ask you to indicate how much you feel a certain emotion, such as how much you feel cheerful or sad at the moment. Anxiety scales will ask you how you feel at the moment, involving words such as calm or upset on a scale from “not at all” to “very much.” Stress surveys will ask how you would respond to certain situations; such as how well you can relax after a hard day at work or how much you can enjoy leisure time when you feel under stress. Attitude towards animals will ask you to give a rating to certain statements such as “I would like a pet in my home.” General demographic information will ask about your age, gender, relationship status, etc.
- It may take approximately 30 minutes to participate.

Risks:

Some questions may make you feel uncomfortable or distressed. You may skip any question that you would rather not answer, and you may stop participating at any time during the study. If you would like to speak with a professional about your experiences, you are encouraged to contact the University of Maine Counseling Center (581-1392), which provides free services to UMaine students. Information about the Counseling Center, including their hours of operation, can be found at <http://umaine.edu/counseling/contact-us/>

Benefits:

Although there may be little to no direct benefit to you for participating in this research, your responses will tell us more about how certain activities effect college

student's mood and stress.

Confidentiality:

Your responses to the questionnaires will be anonymous. There will be no connection between your responses to the questionnaires and any of your identifying information. A random code number will be used to protect your identity. If the study is presented, only information based upon the entire group of participants will be used. Data will be stored in Dr. Erdley's locked laboratory room in Little Hall and will be destroyed by June, 2015.

Voluntary

Your participation in this study is voluntary. You may choose to withdraw from the study at any point. You may also choose to skip any questions that you do not want to answer.

Compensation

You will receive one research credit for participating in the survey. Even if you choose to skip some questions or stop your participation, you will still receive one credit.

Contact Information

If you have any questions about this study, please contact me via FirstClass. You may also reach the faculty advisor on this study through FirstClass. If you have any questions about your rights as a research participant, please contact Gayle Jones, Assistant to the University of Maine's Protection of Human Subjects Review Board, at 581-1498 (or e-mail gayle.jones@umit.maine.edu).

Your signature below indicates that you have read the above information and agree to participate. You will receive a copy of this form.

Participant's Signature: _____ **Date:** _____

Appendix D
Demographic Questionnaire

1. Please provide the following information about yourself:
 - a. What is your gender?
 - i. Male
 - ii. Female
 - b. Please enter your age: _____
 - c. Ethnicity
 - i. Caucasian
 - ii. Asian
 - iii. Hispanic
 - iv. African American
 - v. American Indian
 - vi. Other (please specify)
 - d. What year are you at UMaine?
 - i. First Year
 - ii. Sophomore
 - iii. Junior
 - iv. Senior
 - v. Non-degree student
 - e. What is your relationship status?
 - i. Single
 - ii. Dating
 - iii. Engaged
 - iv. Married
 - v. Divorced
 - f. Where do you live?
 - i. On campus – alone
 - ii. On campus – with roommates
 - iii. Off campus - alone
 - iv. Off campus with relatives
 - v. Off campus with nonrelatives
 - g. Do you have a pet dog?
 - i. Yes
 - ii. No
 - h. If yes, are you currently living with the dog?
 - i. Yes
 - ii. No
 - i. About how often do you have contact with a dog?
 - i. Never
 - ii. A few times a year
 - iii. About once a month
 - iv. About once a week
 - v. A few times a week
 - vi. Every day
 - j. Would You describe yourself more as a:
 - i. Dog Person
 - ii. Cat Person
 - iii. Neither

Appendix E

The Pet Attitude Scale

Please answer each of the following questions as honestly as you can, in terms of how you feel right now. This questionnaire is anonymous and no one will ever know which were your answers. So, don't worry about how you think others might answer these questions. There aren't any right or wrong answers. All that matters is that you express your true thoughts on the subject.

Please answer by circling one of the following seven numbers for each question:

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

For example, if you slightly disagree with the first item, you would circle 3.

Thank you for your assistance.

1. I really like seeing pets enjoy their food.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

2. A pet would mean more to me than any of my friends.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

3. I would like a pet in my home.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

4. Having pets is a waste of money.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

5. House pets add happiness to my life (or would if I had one).

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

6. I feel that pets should always be kept outside.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

7. I spend time every day playing with my pet (or I would if I had one).

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

8. I have occasionally communicated with my pet and understood what it was trying to express.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

9. The world would be a better place if people would stop spending so much time caring for their pets and started caring more for other human beings instead.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

10. I like to feed animals out of my hand.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

11. I love pets.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

12. Animals belong in the wild or in zoos, but not in the home.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

13. If you keep pets in the house you can expect a lot of damage to the furniture.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

14. I like house pets.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

15. Pets are fun but it's not worth the trouble of owning one.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

16. I frequently talk to my pet (or would if I had one).

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

17. I hate animals.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

18. You should treat you house pets with as much respect as you would a human member of your family.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Unsure	Slightly agree	Moderately agree	Strongly agree

Appendix F

PANAS-X

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now. Use the following scale to record your answers:

1 Very slightly or not at all	2 A little	3 Moderately	4 Quite a bit	5 Extremely
<input type="checkbox"/> cheerful	<input type="checkbox"/> sad	<input type="checkbox"/> active	<input type="checkbox"/> angry at self	
<input type="checkbox"/> disgusted	<input type="checkbox"/> calm	<input type="checkbox"/> guilty	<input type="checkbox"/> enthusiastic	
<input type="checkbox"/> attentive	<input type="checkbox"/> afraid	<input type="checkbox"/> joyful	<input type="checkbox"/> downhearted	
<input type="checkbox"/> bashful	<input type="checkbox"/> tired	<input type="checkbox"/> nervous	<input type="checkbox"/> sheepish	
<input type="checkbox"/> sluggish	<input type="checkbox"/> amazed	<input type="checkbox"/> lonely	<input type="checkbox"/> distressed	
<input type="checkbox"/> daring	<input type="checkbox"/> shaky	<input type="checkbox"/> sleepy	<input type="checkbox"/> blameworthy	
<input type="checkbox"/> surprised	<input type="checkbox"/> happy	<input type="checkbox"/> excited	<input type="checkbox"/> determined	
<input type="checkbox"/> strong	<input type="checkbox"/> timid	<input type="checkbox"/> hostile	<input type="checkbox"/> frightened	
<input type="checkbox"/> scornful	<input type="checkbox"/> alone	<input type="checkbox"/> proud	<input type="checkbox"/> astonished	
<input type="checkbox"/> relaxed	<input type="checkbox"/> alert	<input type="checkbox"/> jittery	<input type="checkbox"/> interested	
<input type="checkbox"/> irritable	<input type="checkbox"/> upset	<input type="checkbox"/> lively	<input type="checkbox"/> loathing	
<input type="checkbox"/> delighted	<input type="checkbox"/> angry	<input type="checkbox"/> ashamed	<input type="checkbox"/> confident	
<input type="checkbox"/> inspired	<input type="checkbox"/> bold	<input type="checkbox"/> at ease	<input type="checkbox"/> energetic	
<input type="checkbox"/> fearless	<input type="checkbox"/> blue	<input type="checkbox"/> scared	<input type="checkbox"/> concentrating	
<input type="checkbox"/> disgusted with self	<input type="checkbox"/> shy	<input type="checkbox"/> drowsy	<input type="checkbox"/> dissatisfied with self	

Appendix G
Six-item Short-form of State Scale of STAI

Read each statement and then circle the most appropriate number to the right of the statement to indicate how you feel *right now*, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	<i>Not at all</i>	<i>Somewhat</i>	<i>Moderately</i>	<i>Very Much</i>
1. I feel calm	1	2	3	4
2. I am tense	1	2	3	4
3. I feel upset	1	2	3	4
4. I am relaxed	1	2	3	4
5. I feel content	1	2	3	4
6. I am worried	1	2	3	4

Appendix H

The 23-Item Version of the Perceived Stress Reactivity Scale (PSRS)

Instructions: This questionnaire asks about your reactions to situations, which you may have experienced in the past. Please circle the answer that most closely describes your own present reaction.

PSRS Scale Scoring

1. When tasks and duties build up to the extent that they are hard to manage...	1 I am not troubled	2 I am generally untroubled	3 Neutral	4 I usually feel a little uneasy	5 I normally get quite nervous
2. When I want to relax after a hard day at work . . .	1 This is very difficult for me	2 This is usually quite difficult for me	3 Neutral	4 I usually succeed	5 I generally have no problem at all
3. When I have conflicts with others that may not be immediately resolved...	1 I shrug it off	2 I generally shrug it off	3 Neutral	4 I sometimes feel unsure about my abilities	5 I often have doubts about my abilities
4. When I make a mistake...	1 I remain confident	2 I usually remain confident	3 Neutral	4 I sometimes feel unsure about my abilities	5 I often have doubts about my abilities
5. When I'm wrongly criticized by others...	1 I am annoyed for a long time	2 I am annoyed for a while	3 Neutral	4 A am annoyed for just a short time	5 I am hardly annoyed at all
6. When I argue with other people...	1 I calm down quickly	2 I calm down fairly quickly	3 Neutral	4 I usually stay upset for some time	5 It takes me a long time to calm down
7. When I have little time for a job to be done...	1 I stay calm	2 I usually stay calm	3 Neutral	4 I usually feel uneasy	5 I get quite agitated
8. When I make a mistake...	1 I am annoyed for a long time	2 I am annoyed for a while	3 Neutral	4 I get over it after a while	5 I get over it easily
9. When I am unsure what to do or say in a social situation...	1 I stay cool	2 I usually stay cool	3 Neutral	4 I often feel warm	5 I often begin to sweat

10. When I have spare time after working hard...	1 It is difficult to relax	2 It is usually difficult to relax	3 Neutral	4 I need some time before relaxing	5 I can relax quickly
11. When I am criticized by others...	1 I never have a good reply	2 I often have difficulty finding a good reply	3 Neutral	4 I can usually think of a good reply	5 I can think of a reply to defend myself
12. When something does not go the way I expected...	1 I stay calm	2 I usually stay calm	3 Neutral	4 I often get uneasy	5 I get very agitated
13. When I do not attain a goal...	1 I remain annoyed for a long time	2 I am annoyed for a while	3 Neutral	4 I am usually disappointed, but recover soon.	5 I am hardly concerned at all
14. When others criticize me...	1 I don't lose confidence	2 I usually don't lose confidence	3 Neutral	4 I generally lose a little confidence	5 I feel very unconfident
15. When I fail at something...	1 I find it hard to accept	2 I usually find it hard to accept	3 Neutral	4 I accept it to some degree	5 I hardly think about it
16. When there are too many demands on me at the same time...	1 I stay calm	2 I usually stay calm	3 Neutral	4 I get uneasy	5 Even minor interruptions irritate me
17. When others say something incorrect about me . . .	1 I get upset	2 I usually get upset	3 Neutral	4 I get a little bit upset	5 I shrug it off
18. When I fail at a task...	1 I feel very uncomfortable	2 I usually feel uncomfortable	3 Neutral	4 I feel somewhat uncomfortable	5 I don't mind
19. When I argue with others...	1 I get very upset	2 I usually get upset	3 Neutral	4 I get a little bit upset	5 I don't get upset
20. When I am under stress...	1 I can't enjoy leisure time	2 I usually can't enjoy my leisure time	3 Neutral	4 I somewhat enjoy my leisure time	5 I enjoy my leisure time

21. When tasks and duties accumulate to the extent that they are hard to cope with...	1 My sleep is unaffected	2 My sleep is usually unaffected	3 Neutral	4 My sleep is slightly disturbed	5 My sleep is very disturbed
22. When I have to speak in front of other people...	1 I get very nervous	2 I usually get very nervous	3 Neutral	4 I get somewhat nervous	5 I stay calm
23. When I have many tasks and duties to fulfill...	1 I stay calm	2 I am usually calm	3 Neutral	4 I get impatient	5 I get irritable

Appendix I

Introduction Script

Script for Experimental Condition: Now that you have finished the first part of surveys, are you willing to be in the same room as a dog? If you are, you will be allowed to interact with this dog for five minutes, and then take a few more surveys.

Script for Control Condition: Now that you have finished the first part of surveys, are you willing to watch an informational video? If you are, you will watch this video for five minutes and then take a few more surveys.

Appendix J

Debriefing Statement

This concludes the survey and task portions of the research study. Thank you for your participation in this research study.

This study was looking at how a dog might affect a college student's mood and stress. Some participants got to interact with a dog, while other participants watched an informational video as the control group. Now that you have finished this study I ask you please not to tell any other potential participants what this study is about, since knowledge of the study's purpose could impact other participants' responses.

Once again, thank you very much for your participation.

Author's Biography

Mariah Jocelyn Picard was born in Biddeford, ME on February 4, 1993. She grew up in Dayton, ME, where her two parents, Ken and Jocelyn, raised her along with her two younger sisters, Mayson and McKenna. She graduated from Thornton Academy in 2011 and went on to attend the University of Maine. She received her BA in Psychology with a concentration in Abnormal/Social Psychology and a minor in Business Administration in May of 2015.

From a young age she has enjoyed growing up with pets and interacting with animals around her, which she combined with her passion for psychology to form her thesis. She plans on pursuing the path of helping others by studying Social Work at the University of Maine Graduate School.