5-2013

Do Dogs Increase Learning? The Effect of Therapy Dogs on Academic Stress and Spanish Second Language Learning

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I am submitting herewith a thesis written by Elaine Maralee Henry entitled "Do Dogs Increase Learning? The Effect of Therapy Dogs on Academic Stress and Spanish Second Language Learning." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

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Do Dogs Increase Learning?

The Effect of Therapy Dogs on Academic Stress and Spanish Second Language

Learning

A Thesis Presented for

the Master of Arts Degree

The University of Tennessee, Knoxville

Elaine Maralee Henry

May 2013

Dedication

This thesis is dedicated to my amazing Bernese Mountain Dog, Bear-Acres The Wonder of Glory, CGC, TDI, "Wonder", without whom this research would not have been possible. Wonder, you make me happy every day and encourage me to pursue my dreams. Thank you for your patience and outstanding skills both as a therapy dog and in the show ring. You are a star!

Dedication is also to my first Bernese, Lassie's Legacy March to Glory, "Glory", who was taken from me much too soon. Glory's legacy will live forever.

Acknowledgments

I would like to thank my wonderful Bernese Mountain Dog Wonder for her exemplary performance as a therapy dog in this study. Wonder's consistent, reliable, and sweet actions truly exemplify the standard to which all therapy dogs are held. She made this wonderful study possible. As my personal therapy dog and best friend, Wonder is always there to lend her support during the stressful times in graduate school.

My appreciation to Dr. Debora Baldwin for her help as my thesis advisor and for allowing me to recruit participants from her psychology class, Diana Thomason for suggestions concerning the learning outcome measurement and for assistance with data evaluation, and Dr. Dan Hickman for encouraging me to further explore Spanish second language acquisition during my undergraduate years at Maryville College and for his help with evaluation of phonological data.

I would also like to thank Daniela Recabarren for allowing me to tape her pronunciation as a native Spanish speaker and Dr. Katherine Rowinski for helping with the study design and for giving her classes extra credit to participate in this experiment. Dr. Matt Cooper's help during a data analysis emergency was most appreciated. Last but certainly not least, I extend my sincere appreciation to my master's thesis committee members, Dr. Debora Baldwin, Dr. Michael Olson, Dr. Gina Owens, and Dr. Katherine Rowinski for their support and excellent feedback during this research process.

Abstract

Numerous physiological changes occur during periods of high stress and learning Spanish as a second language in a classroom setting may induce significant levels of academic stress. A possible solution is the use of therapy dogs in second language classes since therapy dogs are known to lower stress and improve physiological measures such as heart rate and blood pressure. Data were collected from 18 University of Tennessee-Knoxville juniors and seniors. A within subjects design required participants to listen to a short Spanish lesson during three conditions: baseline, therapy dog, and no therapy dog. In all conditions, saliva samples were collected to test for cortisol levels and three surveys (Foreign Language Classroom Anxiety Scale, Life Orientation Test, and General Self-Efficacy Scale) were completed. Phonological learning was measured during the last two conditions. Two Spanish instructors evaluated each participant's phonological accuracy using a 5-point Likert scale. Cortisol assays were completed with the saliva samples. Repeated measures ANOVAs and correlational analyses were performed on all data. Results were mixed and largely non-significant. Mean phonological scores were higher for the therapy dog condition but statistical significance was not achieved. Cortisol levels decreased significantly for each subsequent condition, suggesting that stress was reduced with the passage of time and acclimation to the experimental environment. FLCAS scores were lowest when the therapy dog was present, but the difference was not significant. Findings suggest that therapy dogs do appear to reduce some aspects of stress and improve phonological learning to a small extent. Further studies using measurements that may better capture the stress-relieving abilities of therapy dogs and how that reduced stress may improve second language learning are suggested.

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Section 1

Literature Review

In an increasingly globalized world, it is easier than ever to travel to another country to live, work, attend school, or vacation. With this increase in individuals who are living in their non-native country comes the obvious challenge of communication. Of specific interest to this study is the significant need for native English speakers to attain fluency in Spanish. Many new Spanish-speaking residents have neither the time nor resources to acquire English proficiency prior to entering the country.

Considering that approximately 10% of United States residents are of Hispanic origin, the effects of bilingualism are clearly important to society as a whole (Ardila, Rosselli, Ostrosky-Solis, Marcos, Granda, & Soto, 2000). For example, physicians need to have minimal fluency in Spanish in order to communicate with patients who do not yet speak English. Furthermore, when students with limited English skills are thrust into an English-only classroom, it would be advantageous to their education to have a teacher who is at least somewhat proficient in Spanish. Attesting to the many benefits of bilingualism, one case study illustrates that learning a second language (L2) may be beneficial during the rehabilitation process for individuals with traumatic brain injury (TBI) (Polczynska-Fiszer & Mazaux, 2008). The authors suggested that L2 learning following a brain injury may improve self-esteem and increase long-term post-accident memory.

The most effective way to learn Spanish as a second language (L2) is generally thought to be exposure to it in a naturalistic setting. Learners interacting with the target language in its native country tend to be more motivated and precise (Snow &

Hoefnagal-Hohle, 1977) as well as more likely to receive adequate amounts of comprehensible input. However, since it is difficult to take the students to the language, the language must be brought to them. Teaching an L2 in a traditional classroom setting is less than ideal for many reasons, including limited exposure time for rehearsal, motivation for grades overshadowing the desire for proficiency, and students feeling apprehensive about participating in class. Academic stress and anxiety may significantly reduce an L2 learner's ability to become proficient in the language (von Worde, 2003).

One behavioral intervention for reducing the stress associated with L2 learning is pet therapy. Therapy dogs lower stress, have a relaxing effect, and reduce blood pressure and heart rate (Jalongo, Astorino, & Bomboy, 2004; Taylor, 2012). By introducing therapy dogs into Spanish L2 classrooms, it may be possible to negate the typical stressful effects of classroom learning. This possibility will be investigated by exploring the social causes for academic stress, identifying the physiological processes by which stress impairs learning and memory, examining the role of therapy dogs on stress, and, specifically, evaluating how therapy dogs may be correlated with increased Spanish L2 learning.

Physiological Effects of Stress on Learning

Stress occurs in response to a situation that provokes a "fight or flight" response. During this state, the body is mobilizing all available resources to either escape or attack (Zoladz & Diamond, 2009). Normal functions such as learning and food digestion are reduced to allow the body to focus on dealing with the stressor. Though academic stress may not be as explicit as the more primitive type of stress associated with survival needs and "escape or attack" may not be an option, it can still cause significant

physiological and cognitive changes. When the sympathetic nervous system is triggered, the sympathetic-adrenomedually system causes epinephrine, or adrenalin, to be produced at a higher than average rate (Zoladz & Diamond, 2009). Epinephrine causes excitatory responses and, in high quantities, may impair functioning. Sympathetic nervous system arousal is associated with increased blood pressure and heart rate, dilation of pupils, decreased digestion, enhanced blood flow to the heart and vascular system, and sweating (Zoladz & Diamond, 2009). If the hypothalamic-pituitary-adrenal (HPA) axis is activated, the adrenal cortex releases a precursor to cortisol. This initiates a slower, but more long-lasting effect (Dickerson & Kemeny, 2004). High cortisol is correlated with problems such as reduced memory and learning capacity, damage to dendrites in the hippocampal region, and less effective long-term hippocampal potentiation (Yehuda et al., 2000; Zoladz & Diamond, 2009). Other harmful effects of high cortisol levels include increased levels of blood glucose, increased protein decomposition, and higher rates of Alzheimer's disease (Yehuda et al., 2000). Following spikes in cortisol levels, negative feedback loops then must work to return the body to homeostasis, which is defined as a normal and balanced state of functioning (Zoladz & Diamond, 2009).

One of the easiest and most effective ways to measure stress is by assessing levels of cortisol. Nearly all research agrees that stress elevates cortisol levels (Yehuda, Rabinovitz, Carasso, & Mostofsky, 2000). Cortisol can be measured via blood or saliva. Saliva sampling is a noninvasive method that is highly correlated with serum levels of cortisol (Umeda et al., 1981). Consequently, salivary cortisol is frequently used as a biomarker of psychological stress (Hellhammer, Wust, & Kudielka, 2009).

The hippocampus, found in the temporal lobe, is crucial for memory-related functions, especially declarative memory. Though the prefrontal cortex is integral in the process of constructing memories, it is the hippocampus that is responsible for most memory storage (Anderson, 2010). If it is impaired, learning is significantly reduced. Though mild, short-term stress may improve hippocampal efficiency through moderate levels of excitatory neurotransmitters, extensive or long-duration stressors significantly impair the hippocampal region (Sapolsky, 2004). Studies with rats have shown that long-term potentiation, the mechanism through which long-term memories are created, is not only damaged by stressors, but is also reduced for as much as two days after a stress-inducing experiment (Zoladz & Diamond, 2009). If this finding generalizes to humans, it suggests that the stress associated with one Spanish L2 class could carry over until the next class begins, literally creating a constant stressor. For many individuals, learning is a rewarding process, either due to grades or internal satisfaction. However, stress has even been found to inhibit the brain's pleasure centers and reduce reinforcement-moderated learning (Bogdan, Perlis, Fagerness, & Pizzagalli, 2010).

Stress, Cognition, and Language Learning

The cognitive processes underlying L2 learning are significantly affected by stress and classroom anxiety. Cognitive and attentional resources available for learning and retention may be depleted by high levels of stress. The attentional control theory suggests that individuals with high anxiety levels are more likely to be distracted by extraneous or unimportant stimuli and therefore less able to dedicate the appropriate amount of cognition to learning (Moriya & Tanno, 2010). High levels of stress appear to reduce the inhibition function of the central executive. When the inhibition function is not

working normally, a person is more likely to attend to irrelevant or distracting stimuli instead of the task at hand (Derakshan & Eysenck, 2009).

Social anxiety is mentioned as a likely cause of reduced attentional control (Moriya & Tanno, 2010) and the environment found in an L2 classroom may well be a cause of such social anxiety. Stress is even more detrimental to learning when the task is complicated or requires significant cognitive involvement (Derakshan & Eysenck, 2009). L2 learning is different from other types of academic subjects because it requires integrating comprehension, expression, reproduction, and generation in a complex manner so that the person can effectively represent the world and communicate in another language. Stress and anxiety make cognitive processing of tasks both less efficient and less accurate (Derakshan & Eysenck, 2009). As previously alluded, the attentional control theory asserts that the central executive is impaired in its ability to allocate attention and direct cognitive processing when anxiety is high (Derakshan & Eysenck, 2009).

It is possible that reduced hippocampal functioning combined with lessened central executive control could lead to poor learning outcomes for L2 learners who are experiencing significant stress for two reasons. First, items learned may not be encoded properly and, secondly, they may be processed initially but not retrieved at a later point. Research does suggest that many items cannot be actively retrieved but may still be present in memory (Anderson, 2010).

In the specific context of L2 learning, stress causes numerous problems. Anxiety and stress diminish L2 learning by decreasing comprehension of input, hindering memory retrieval, and causing an overall sense of apprehension which may have a

snowball effect and lead to even more stress (von Worde, 2003). Since the student is required to attempt communication in a foreign language, stress levels may be higher than in non-language classes (von Worde, 2003). The Foreign Classroom Anxiety Scale (FLCAS), a 33-item measure which uses five point Likert scale ratings to assess fear of communication, testing, and negative evaluation, was used to determine some causes of L2 classroom stressors. Many students expressed high levels of stress and disliked the classroom atmosphere for learning an L2, citing stressors such as grades, negative comparisons to native speakers, teaching methods that did not correlate with real world communication ability, nervousness over being asked to respond to a question, and fear of evaluation from both instructors and other students (von Worde, 2003).

Foreign Language Anxiety (FLA) is a well-accepted fact in the fields of psychology, education, and linguistics; furthermore, students with high FLA are less likely to ever use what they have learned about the L2 in their post-college lives (Dewaele, 2007). To combat the often-incapacitating levels of stress in L2 classrooms, instructors are encouraged to try to reduce classroom stress and tension by creating a friendly atmosphere where self-esteem can grow (Noormohamadi, 2009). Likeable and appealing pedagogical agents have been found to increase learning, probably because they reduce tension and increase motivation (Domagk, 2010). The current study aims to introduce therapy dogs as a means of building a learning environment that is more relaxed, stress-free, and encouraging than those currently found in L2 classrooms.

Social Interactions and Language Learning

As social creatures, humans learn in the context of their culture; that is, learning does not occur independent of social factors. Language is a socially acquired tool

(Smith, 2011) and it is nearly impossible to learn an L2 with native-like proficiency outside of a social setting. The issue of social motivation could definitely affect how diligently an individual is willing to work to attain a native-like L2 proficiency, especially when issues such as cultural identity and prejudice are drawn into the equation.

Since classroom interactions are inherently social, it is necessary to understand some mechanisms through which the other individuals present in a classroom setting could impair an L2 learners' ability to grasp the language. Fear of evaluation in the form of grades or instructor comments can lead students to reduce their level of participation and engagement. Social facilitation literature states that the presence of others can be especially detrimental when a person is not yet masterful or proficient at the task at hand, such as a beginning L2 learner (Zajonc, 1965). Even in the absence of antagonistic relationships among classmates, the mere presence effect may be able to explain why learning retention is often lower in a classroom setting. Social inhibition, defined as the worsening of learning when other individuals are present, is especially prevalent among those with low levels of self-efficacy (Klehe, Anderson, & Hoefnagels, 2007). Furthermore, in conditions where participants must give above-average performances (and particularly for those who are novices at the task or who have low self-efficacy), social inhibition is particularly likely to cause additional stress and result in decreased performance (Klehe et al., 2007).

The drive theory of social facilitation claims that being in a social setting increases overall arousal (Platania & Moran, 2001). This amplification of alertness and energy levels may be beneficial for some tasks. However, the heightened alertness found in participants simply because of the mere presence effect also reduces learning

and retention (Rajecki, Ickes, Corcoran, & Lenerz, 1977). Contrary to the stimulating and stress-provoking effects of learning in a social setting, social loafing could also decrease motivation to perform in tasks such as group discussions (Karau, S.J., & Williams, K.D., 1993). If a student feels that their lack of contributions will not be noticed or rewarded since others are participating, he or she may be inclined to let the most assured students carry the conversation (Klehe et al., 2007).

Motivation to learn the L2 and attitudes about it are other important factors. Since stereotyping is thought to be a form of dominance, prejudice often increases in public settings (Lambert et al., 2003). Nearly all L2 learners bring biases of some type with them when they attempt to learn a new language (Smith, 2011). Even interacting with a person of another race has been found to cause cognitive depletion in some instances (Richeson & Trawalter, 2005). If a person is learning a language that is less prevalent than their native language, they may have an increased bias against the L2. This tendency could be exacerbated in the classroom setting due to the social dominance mechanisms of prejudice which were previously mentioned. However, a positive evaluation of the L2 is mentioned as a factor that significantly increases the chances that a person will learn the language well (Denham & Lobeck, 2010).

Conversely, if an individual feels that learning an L2 puts him or her at risk of being swallowed up by the culture of that language, he or she may be more tentative about acquiring an L2. A desire to remain connected to one's native culture seems to motivate this thought process. Fear of losing one's native language and culture may be an especially important finding when discussing late L2 learners, such as college students. If one learns an L2 after puberty, they are already a part of the

language/culture of their native country. Acquiring another language may be a significant cause of stress that is seen as threatening to the native way of life; in this case, the person may not exert much effort to learn the L2. This effect appears to be especially prevalent when the individual's L1 is a minority language and the L2 is a majority language (Clement, Gardner, & Smythe, 1980).

Therapy Dogs, Stress, and Learning

A therapy dog is highly trained to be calm and reliable in all situations. They must be healthy, well groomed, and never fearful or aggressive. Numerous certifications are possible and include Therapy Dog International (TDI) and Delta. TDI is the largest and arguably most prestigious therapy dog certification program. The American Kennel Club's Canine Good Citizen (CGC) test must be passed, as well as additional requirements such as leaving enticing food on the floor and calmness around wheelchairs and walkers.

Numerous areas of pet therapy are currently implemented in many types of settings and novel ways of using therapy dogs to help humans are still being discovered. Dogs interact with nursing home and assisted living facility residents, those with dementia, hospital patients, sick children, assist with school reading programs, and some colleges even have therapy dogs for their homesick freshmen! The amazing connection that many people feel with dogs has recently been found to be more beneficial than even the most ardent pet parent may have previously assumed. Benefits of interacting with dogs include diminished stress, reduced blood pressure and heart rate, long-term improved cardiovascular health, and even lower levels of depression (Jalongo, Astorino, & Bomboy, 2004). Children have also shown less psychological and

behavioral distress during a stress-provoking condition (such as visiting a doctor's office) if a therapy dog is present (Friesen, 2010).

The recent increase in programs such as Reading Education Assistance Dogs (READ), founded in Salt Lake City in 1999, attest to the growing interest in using dogs to enhance educational outcomes. Advantages of therapy dogs with school age children are extensive and include: better emotional stability and more positive attitudes about attending school in children with emotional disorders, longer attention spans, higher willingness to cooperate, greater self-esteem, and more relaxed affect, increased levels of participation in both class and social situations (Friesen, 2010). Furthermore, a dog's presence encourages calm and focused classroom interactions and reduces overall tension (Friesen, 2010). While dogs have long been considered family members by many (Walsh, 2009), the newer developments in using dogs with school children of all ages are very exciting and could easily be transitioned into a program where therapy dogs are integrated into college L2 classrooms.

Therapy dogs may increase L2 learning by reducing stress, but they may also play a part in helping individuals use cognitive reappraisal to view classroom anxiety in a more constructive manner. Suppression of negative reactions such as stress and anxiety leads to an increased sympathetic nervous system response (Niedenthal, Krauth-Gruber, & Ric, 2006). If therapy dogs elicit emotional openness and promote a relaxed classroom atmosphere, they may help to reduce suppression. Furthermore, having a dog present could encourage students to rethink their schemas regarding the typical stressful classroom setting. Cognitive reappraisal refers to altering the way a person thinks about a given scenario or emotion (Niedenthal et al., 2006). A therapy

dog who is always present to interact with individuals could help students change their negative evaluation of the classroom to a positive one. This simple re-evaluation of what classroom interactions entail could reduce stress and subsequently improve L2 learning.

Section 2

Purpose and Hypothesis

The current study seeks to make a connection between two previously well-documented findings. First, research indicates that increased stress leads to reduced learning and worsened long-term retention of material (Yehuda, Rabinovitz, Carasso, & Mostofsky, 2000). Secondly, therapy dogs have been found to reduce stress and improve physiological functioning in areas such as heart rate and blood pressure (Jalongo, Astorino, & Bomboy, 2004). If therapy dogs reduce stress and lowered stress equals improved academic learning outcomes, it is logical to surmise that the addition of therapy dogs to classrooms should facilitate greater learning. Specifically, this study predicts that academic stress related to L2 learning will be reduced by the presence of the therapy dog so that even low-proficiency learners will be able to learn L2 phonology more accurately.

Stress negatively affects learning by disrupting hippocampal functioning and initiating the release of higher levels of cortisol, leading to worse memory and overall poorer learning outcomes. L2 classrooms are significant causes of social stressors for many students and these students' ability to learn may be compromised by such high levels of stress and anxiety. Since therapy dogs have been proven to lower stress, it is hypothesized that the addition of a therapy dog to a Spanish L2 classroom would result in both lower student stress levels as measured by cortisol and, most importantly, increased student L2 learning. Optimism and self-efficacy may also be improved by the relaxing and blissful environment created by the therapy dog since one's troubles are rarely the focus when a happy dog is cheerfully interacting with them.

Section 3

Method

Participants

Participants (n=18) consisted of either juniors (12) or seniors (6) who were currently enrolled in at least one psychology class at the University of Tennessee-Knoxville. Age range was from 20 to 50 years (M=24.2 years). The sample was 78% female (14 females and 4 males) and 61% Caucasian (11 Caucasians, 5 African Americans, and 2 Asians). Most students (72%) indicated that they hoped to receive an A in the language class to which they were referring in the surveys and no one indicated a desired grade below a B. Four participants failed to complete all three conditions and are not included in the data.

No one either lived in a household where Spanish was spoken regularly or was a native speaker of the language. Only one participant had lived or worked in a Spanish speaking country (Costa Rica) for at least one month. Seventeen percent of participants (3) speak another language besides English and Spanish. Participants average 2.6 years of speaking Spanish at any proficiency level and all indicate that the primary method through which they learned the language was classroom instruction. No participants had taken any Spanish classes beyond the 200 level and none considered themselves fluent in the language. All participants indicated that they were comfortable in the presence of dogs and none reported any allergies to dogs.

Participants were recruited from University of Tennessee psychology class(es) using the convenience sampling method. Instructor permission for student recruitment was secured prior to announcements. Participation in the study was voluntary, no

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results were made available to the instructor, and informed consent was collected before the study began. Students who chose not to participate were not penalized in any way. There was no monetary incentive for participation. Instructor agreed to give extra credit for study participation. Participants were required to complete all three conditions to receive extra credit. An alternative extra credit opportunity was available for students who chose not to participate in the study.

Diana Thomason served as an advisor and Spanish expert for the project. She assisted with learning outcome development and ensuring that the study accurately reflects Spanish learning. Ms. Thomason also agreed to evaluate data for phonological proficiency. A second data evaluator was Dr. Dan Hickman, Maryville College Instructor of Spanish. A native Spanish speaker (who is also a graduate student in the psychology department) audio-taped the Spanish lessons.

Materials

An informed consent form briefly described the study and any associated risks. A screening questionnaire to determine level of current L2 proficiency and dog preference survey to determine their eligibility for the study was included. Participant demographics and questions intended to determine the subjects' comfort level with dogs were gathered. The questionnaire ensured that no participants who were allergic to or afraid of dogs were included. It also asked questions designed to ascertain the format of previous Spanish L2 exposure (home, classroom, etc.) and gather participant descriptions of their current L2 proficiency level.

The learning outcome measure consisted of six Spanish sentences (per condition) that were significantly more advanced than anything the students would

realistically have encountered at their current level of education. Three such learning outcome measures were matched for difficulty level to ensure that no one condition included a more challenging measure. The poem "La Princesa" was audio recorded by a native Spanish speaker and used to teach participants. One stanza was taught during each condition.

The Foreign Classroom Anxiety Scale (FLCAS) served as a self-report measure of stress and anxiety related to L2 learning (Horwitz, Horwitz, & Cope, 1986). Stress related to three sub-categories of L2 anxiety (test anxiety, communication hesitancy, and fear of negative evaluation) are evaluated by the FLCAS. A five-point Likert scale with answers ranging from strongly disagree to strongly agree is used on all 33 items. The measure has been reported to have strong reliability scores (α=.93) (von Worde, 2003). See appendix for this and all other measures.

A 12-item optimism survey (Life Orientation Test or LOT) was used to determine participants' level of general optimism (Scheier & Carver,1985). A 5-point Likert scale (1= strongly disagree to 5= strongly agree) assesses responses. Four filler items are included and four items are negatively worded. General optimism towards the challenges of life may indicate participants' likelihood to see themselves as capable of successfully learning an L2. Reliability scores for the LOT are at the lower end of the traditionally acceptable range (α=.73) based on a meta-analysis of the measurement (Vassar & Bradley, 2010).

Participant self-efficacy was assessed with the General Self-Efficacy Scale (GSES) (Bosscher & Smit, 1998). Initiative, effort, and persistence are measured by the 12-item survey. This general self-efficacy scale should reflect participants' more specific

self-efficacy related to L2 learning. Responses range from 1 (strongly disagree) to 5 (strongly agree). Aspects of self-efficacy related to overcoming challenges and creating and carrying out goals are measured. Though the General Self-Efficacy Scale may measure a more general type of self-esteem in addition to the targeted self-efficacy, it has moderately high reliability (α=.76 to .89) (Chen et al., 2001). This measure is located in the appendix.

Another 5-point Likert scale (Snow & Hoefnagal-Hohle, 1977) allowed evaluators to judge phonological proficiency and accuracy of participants' responses. A score of "1" indicates that the phonology is "uninterpretable as target sound", while a "5" designates that the pronunciation of phonemes is equivalent to that of a native Spanish speaker.

Procedure

A within subject design was employed so that the same participants could be compared across three conditions. The first condition was a baseline, during which participants were asked to complete the self-report surveys (e.g., demographic, personality, stress, and learning measures), listen to a short (2 minute) Spanish lecture (via audio tape), and render a resting salivary cortisol sample. During the second condition (low stress), the therapy dog was present and casually interacted with students in the class at all times during the study. At this time, participants were asked to complete the self-report measures, listen to the second phase of the Spanish lesson, complete the learning outcome, and render another saliva sample for subsequent cortisol analysis. Finally, a high stress condition (no therapy dog) required students to complete the same surveys and learning outcome during a typical classroom setting without the therapy dog present. The learning outcomes were different for each

condition to ensure that previous learning did not carry over, but was of similar difficulty. To ensure compatible difficulties, the poem "La Princesa" by Ruben Dario was used. For each condition, one stanza (6 lines) was taught. Conditions were tested approximately two to three days apart. All portions of the study were conducted between 9 and 11 A.M., in order to reduce normal circadian variations in cortisol levels.

After signing informed consent forms, participants were given a participation number and asked to take a seat. Participants signed sheet so they could receive extra credit if they completed all three conditions. The experimenter gave the sign-in sheets to the respective instructors, but no other information about participants was available to the instructors. During each administration, all participants were asked to record their number on the survey package. All desks were arranged in a circle during all conditions. In the therapy dog condition, the dog and handler were in the center of the circle to ensure that all students had equal access to the dog. Students who chose the alternative extra credit assignment read an article related to therapy dogs and wrote a review of it.

Packets were given to each student. Included in each packet were: the Foreign Language Classroom Anxiety Scale (FLCAS), the General Self-Efficacy Scale (GSES), Life Orientation Test (LOT), and the learning outcome measurement. Students were instructed to complete the first three surveys and raise their hand when finished. When all students completed this portion of the study, directions were given about the learning outcome and students were taught the pronunciation and meaning of one stanza of "La Princesa" (six sentences) by means of a short audio recording. Participants then had a five-minute study period and went on to have five minutes to attempt to successfully

translate the Spanish phrases as well as pronounce them. Phonological accuracy was assessed. Student pronunciations were audio recorded and they were asked to stand and face the other participants when speaking in order to maximize stress related to speaking the L2.

During the therapy dog condition, the dog (Therapy Dog International and American Kennel Club Canine Good Citizen certified Bernese Mountain Dog, Bear-Acres The Wonder of Glory, CGC, TDI, "Wonder") was located in the center of the students throughout the teaching, learning, and testing phases of the study. Prior to the study, students had a few minutes to meet and greet the dog so she was not a novel distraction. Students were instructed to interact with the dog if they so desired but not to spend so much time with the dog that they did not have time to focus on learning the phrases.

In all conditions, saliva samples were collected at the end of the session in order to attain a measurement of salivary cortisol levels. Measuring levels of the hormone cortisol is of interest since it is associated with the body's response to stress (e.g, Het, Schoofs, Rohleder, & Wolfe, 2012). Cortisol is present in saliva. Participants were asked to rinse their mouths with a few ounces of water, then sit quietly while allowing saliva to pool in their mouths for 60 seconds. All participants were asked to expectorate into a sanitized 50 ml collection tube once per minute over a 3 minute period (Navazesh, 1993). Samples were centrifuged and alloquated into microtubes and stored at -70º C until subsequent analysis.

A cortisol assay kit (Salimetric, State College, PA) was used to analyze the saliva for cortisol levels, and no other analyses were performed on the sample. The saliva

samples were stored in a freezer in the locked laboratory of the advisor (Walters Life

Science, A304) and were destroyed immediately after analysis. The combination of the

FLCAS and salivary cortisol measurements provides both self-report and physiological

measures of stress.

Quantitative data (e.g., cortisol levels, learning outcome results, surveys) were

used. Pronunciation recordings were rated by two Spanish experts on a 5-point Likert

scale (see appendix). To test the hypothesis regarding effectiveness of therapy dogs

on learning outcomes, personality, and stress levels, a repeated analysis of variance

was performed on the data. To examine relationships between variables, the data were

subjected to correlational analyses. Data analysis was performed using SPSS for

Windows, 21.

<center>**Section 4**</center>

<center>**Results**</center>

Results were analyzed to test the hypothesis that the therapy dog condition would contain higher phonology scores, decreased cortisol levels, lower foreign language anxiety, and higher optimism and self-efficacy scores.

Phonology Likert scores were the mean results from two evaluators. Inter-rater reliability was moderately low for the therapy dog (second) condition (r = .40) and low for the high stress (third) condition (r = .29). Evaluator one showed higher scores for both the therapy dog condition (M = 2.00, SD = 1.03) and the high stress condition (M = 1.89, SD = .76) than did evaluator two (M = 1.22, SD = .43; M = 1.11, SD = .32). A repeated measures ANOVA was conducted to ascertain whether the therapy dog condition (M = 1.61, SD = .63) reported higher mean phonology scores than did the high stress, no therapy dog condition (M = 1.50, SD = .45). Results were not significant, F(1,17) = 1.36, p = .26. Figure 1 shows the mean Likert phonology scores from both evaluators. A multiple linear regression was used to test if phonology predicted other dependent variables and results were non-significant (p > .05).

Cortisol displayed a marginally significant difference as the result of time (condition), F(2, 16) = 2.69, p = .08. There was also a significant linear trend that cortisol levels decreased in each subsequent condition, F(1, 17) = 6.61, p = .02. Although the therapy dog condition had lower cortisol levels (M = .36 μg/dL, SD = .18) than did the baseline condition (M = .42 μg/dL, SD = .28), it showed higher cortisol concentrations than the third (no therapy dog) condition *(M = .30 μg/dL, SD = .19).*

Figure 2 illustrates this relationship. Table 1 contains each participant's cortisol levels by condition.

The therapy dog condition (M = 95.44, SD = 21.00) was lower in foreign language anxiety levels than either the baseline condition (M = 98.22, SD = 22.51) or the high stress condition (M = 97.44, SD = 21.65). Figure 3 depicts the mean FLCAS scores by condition. A repeated measures ANOVA was also performed on the FLCAS scores to see if foreign language anxiety was significantly lower for the therapy dog condition, $F(2,16)$ = 1.37, p = .28. Results showed there was no significant main effect for time (condition), $F(2,16)$ = 1.04, p = .36, and that there was no linear trend, $F(1,17)$ = .12, p = . 74. For the baseline condition, FLCAS scores were significantly negatively correlated with LOT scores $(r$ = -.55, p = .02) such that optimism ratings increased as foreign language anxiety scores decreased. The therapy dog condition also showed a significant, negative relationship between FLCAS scores and LOT ratings (r = -.58, p = .01). Furthermore, FLCAS scores during the therapy dog condition had a marginal, negative association with GSES ratings (r = -.447, p = .06) so that self-efficacy ratings increased as language anxiety scores decreased.

Baseline condition LOT scores (M = 31.56, SD = 3.90) were slightly lower than those from either the therapy dog condition (M = 32.17, SD = 4.08) or the high stress condition (M = 32.18, SD = 3.34). Figure 4 illustrates mean scores for both the LOT and GSES by condition. Another repeated measure ANOVA showed no significant differences between LOT scores, $F(2,15)$ = 1.06, p = .37. There was no main effect for time (condition), $F(2,15)$ = .89, p = .42, and no significant linear trend, $F(1,16)$ = 1.07, p = .32. During the therapy dog condition only, a marginally significant positive correlation

was present between LOT scores and GSES scores (r = .46, p = .06), indicating that

LOT and GSES scores increased together.

GSES scores were very similar for the baseline (M = 46.11, SD = 5.00), therapy

dog (M = 46.06, SD = 4.87), and high stress conditions (M = 46.44, SD = 6.09). A

repeated measures ANOVA showed no significant differences for GSES scores, F(2,

16) = .15, p = .86. Furthermore, there was not a linear trend, F(1,17) = .21, p = .66, and

no significant main effect for time (condition), F(2,16) = .20, p = .82.

Section 5

Discussion

The hypothesis that therapy dogs would increase Spanish L2 phonological learning by reducing stress levels was partially supported. Mean phonological scores were higher for the therapy dog condition; however, statistical significance was not achieved. FLCAS mean scores were lower when the therapy dog was present, suggesting that the dog's presence was correlated with reduced levels of foreign language anxiety. This difference was, again, too small to be significant at the .05 significance level. Cortisol levels decreased in each subsequent condition, suggesting that familiarity with the experiment and surroundings was likely confounded with any effect the therapy dog may have had. Optimism and self-efficacy levels as measured by the LOT and GSES were very similar across all conditions.

This study's failure to illustrate a significant reduction in stress when the therapy dog is present is not congruent with most previous research. The non-judgmental and emotionally supportive role played by the therapy dog typically reduces stress in both children and adults (Friesen, 2010). Furthermore, numerous physiological measures such as blood pressure and heart rate are improved through interaction with a therapy dog (Jalongo et al., 2004). The current study's finding that mean cortisol levels were lowest during the last condition of the experiment strongly suggests that acclimation to the experimental procedure outweighed any potential stress-reduction benefit provided by the therapy dog. It is, however, also possible that the dog's presence was remembered from the previous session and responsible for a carry-over type of effect.

One previous study reports that blood pressure reduction was found only *after* participants had interacted with a therapy dog and suggests that autonomic physiological processes which are affected by touching and talking to a dog are delayed and may not be noticeable until sometime after the interaction has taken place (Somervill et al., 2008). This finding is extremely relevant to the current study since all measures were completed within thirty minutes. It is indeed possible that cortisol levels did not have enough time to maximally decrease in response to the therapy dog. Furthermore, the surveys were completed at the beginning of each condition at which time significant amounts of interaction with the therapy dog had not yet been able to occur. Participants were seated at a large table and spent, at most, one minute with the therapy dog each of the three times she circled the room with her handler. Instead of only being able to lean over and pet her briefly on the head, it may be desirable for participants to have longer interactions and the ability to have more physical contact with the therapy dog. If the majority of physiological changes do not transpire until after the therapy animal has been removed (Somervill et al., 2008), then this experiment's design and limited study time may have been detrimental.

Individual differences in both fondness for dogs and physiological responses to them are also noted (Somervill et al., 2008). With a sample of only 18 participants, it is possible that a significant number were not true dog lovers and thus not likely to experience reductions in stress when the therapy dog was present. The one previous study that found similar, non-significant results in physiological measures of stress in response to a therapy dog also asserts that long-term interaction with a dog (such as during pet ownership or extended visits with a therapy dog) is likely to be much more

effective than limited duration visits (Somervill et al., 2008). While short visits with therapy dogs are often correlated with small improvements in physiological measures and stress reduction, only dog ownership or extended care of a dog yields long term cardiovascular benefits (Somervill et al., 2008). Ensuring that participants are truly interested in interacting with the therapy dog and allowing them to enjoy the dog's company for an extended duration of unrestricted (instead of only patting the dog a few times) socialization time may help to alter the current study's mixed results.

The amount of stress necessary to impair learning is another relevant topic in the context of this study. If only intense stress raises cortisol levels and subsequently causes hippocampal impairment (Yehuda et al., 2000), it is possible that this study did not provide the required levels of stress. Social stressors typically found in the second language classroom may have been reduced by the fact that some groups contained seven or fewer individuals. Producing a second language in a classroom setting may cause "startling" levels of anxiety and stress to occur in a student (von Worde, 2003). However, since the experiment was conducted outside of a true classroom setting and students attended primarily for extra credit rather than for a class obligation, it is probable that they did not experience as much stress as they would during a typical Spanish lecture. Finally, saliva samples were collected immediately after the stressor of standing and reading the Spanish phrases in front of the other participants (while being audio recorded) occurred, which may not have allowed hypothalamic-pituitary-adrenal (HPA) axis activation to fully occur before samples were rendered. Complete HPA activation and cortisol production requires precursors to be created and this process, though long lasting, is not immediate (Dickerson & Kemeny, 2004).

Therefore, several explanations as to why learning was not significantly improved are feasible. If the stressor was not adequate, then any effect of the therapy dog would be minimal because learning would not be impaired in the first place. Interestingly, one evaluator noted that, while he did not detect significantly better learning in the therapy dog condition, it was apparent that the participants' speaking cadence and rhythm was "more relaxed and natural" when the therapy dog was present. This effect was so pronounced that he was able to ascertain which condition contained the therapy dog based on only this difference in speech pattern. Perhaps the dog did have an impact on stress reduction, but neither the interaction with the therapy dog nor the period between the stress-invoking reading of the learned material was of a long enough duration to allow cortisol changes to occur. In hindsight, the very limited study timeframe likely precluded any significant results.

Suitability of the optimism and self-efficacy surveys for this particular research setting are also questionable. Previous research examining the effect of therapy dogs on optimism and self-efficacy is not readily available. Despite this, is seems reasonable that, while dogs are likely to increase these feelings in the immediate moment, they may not affect how a person views long term optimism and self-efficacy. Both the LOT and the GSES contained questions that probed the participant's overall optimism and self-efficacy levels for the future as well as the present. Examining these characteristics for only the current time may yield more accurate results in regard to therapy dogs.

Limitations include a relatively small sample size, questionable generalizability since all participants were college undergraduates, and a lack of a diverse sample. Also, the southern accent of most participants probably contributed to Spanish

phonological mistakes that may not have occurred in other regions of the United States. Examples include incorrect aspiration of the "h" in words where the letter should be silent and unnecessarily extended vowel sounds. There was a strong female gender bias as only twenty-two percent (4) of participants were male. Selection bias may have occurred because only those with lower levels of foreign language anxiety may have agreed to participate. Also, since most participants were motivated primarily by extra credit, some may have attended even though they were not dog lovers. None indicated any fear of dogs, but they may have had only neutral opinions about dogs. Though no participants were fluent in Spanish, varying levels of exposure to the language (from none to six years) could have influenced comfort level with the learning outcome material. Of course, the within subjects design likely allowed the participants to become increasingly more comfortable with the procedure in each subsequent condition. As previously mentioned, interaction with the therapy dog was shorter than what would be considered optimal and the entire study may not have allowed time for changes in cortisol levels to transpire.

Low inter-rater reliability scores (therapy dog condition $r = .40$; no dog condition $r = .29$) are explained by the fact that the first evaluator is a high school Spanish teacher, while the second is a college Spanish instructor at a private, liberal arts institution. Evaluators' ratings tended to vary in the same direction; however, the first evaluator appeared to have a higher "starting point" for scoring while the second evaluator appeared to have more stringent expectations based on his Spanish linguistics background and experience with students at a college that has significant foreign language requirements. The second evaluator also commented that rating individual

phonemes instead of assigning one score to the entire stanza would have been more accurate and conveyed that a more precise scale that allowed more rating choices could have been helpful when evaluating the many participants at the very bottom proficiency level. Though the learning outcomes were matched for difficulty by virtue of being stanzas from the same poem, the first evaluator noted that many participants seemed to have more trouble with pronunciation in the no therapy dog condition and that perhaps that stanza contained slightly more challenging phonemes.

The importance of finding methods to reduce foreign language anxiety and increase Spanish L2 learning outcomes is highlighted by this study. Though it is ideal to learn an L2 through immersion in a natural setting (Morgan-Short, Finger, Grey, & Ullman, 2012), that acquisition method is not possible for most students. However, it is conceivable that therapy dogs could be added to foreign language classes. Just as therapy dogs have been found to be very effective at increasing children's reading skills (Friesen, 2010), they could also help college students cope with the pressures and stressors associated with higher education classes.

It is suggested that future research be conducted in environments where extended interactions with therapy dogs can be included. By documenting the physiological changes that occur when higher levels and longer durations of therapy dog interaction occur, we will be better able to ascertain the exact benefits of this type of pet therapy and its possible consequences on the learning process. Investigating how therapy dogs affect optimism and happiness in the current moment is also advocated.

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Appendix
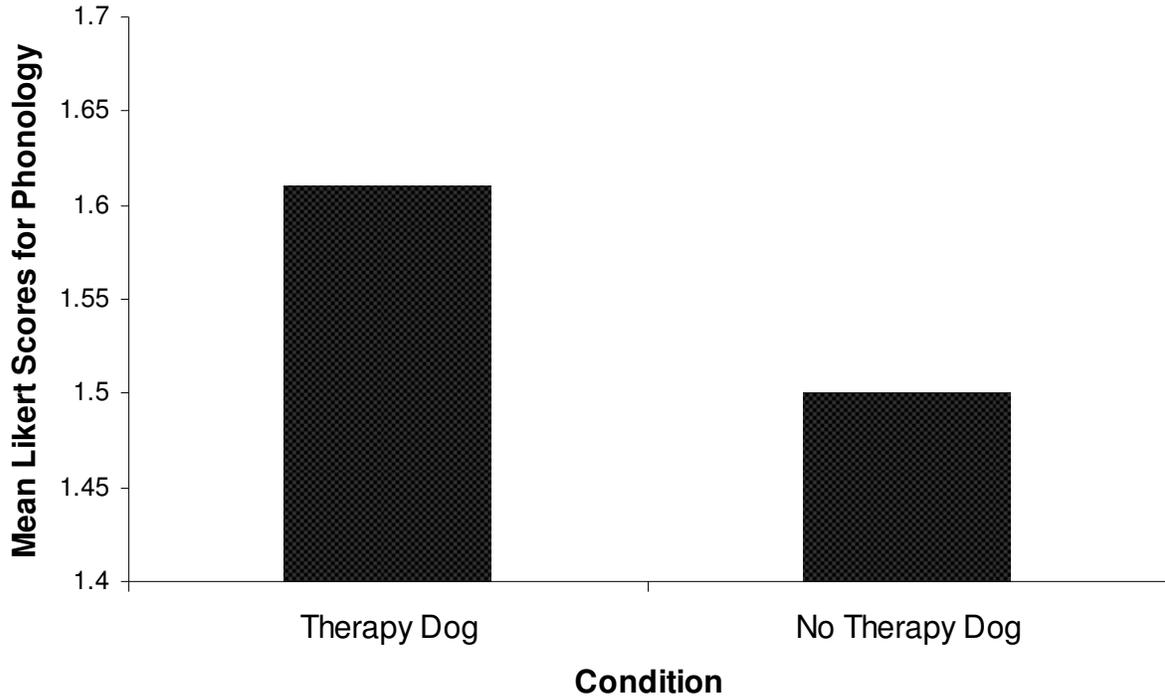
Figure 1. Bar chart illustrating the mean Likert scale ratings for phonology for the therapy dog ($M = 1.61$) and no therapy dog (high stress) ($M = 1.50$) conditions. Ratings are a mean of both evaluators' scores and higher scores indicate greater Spanish phonological proficiency.
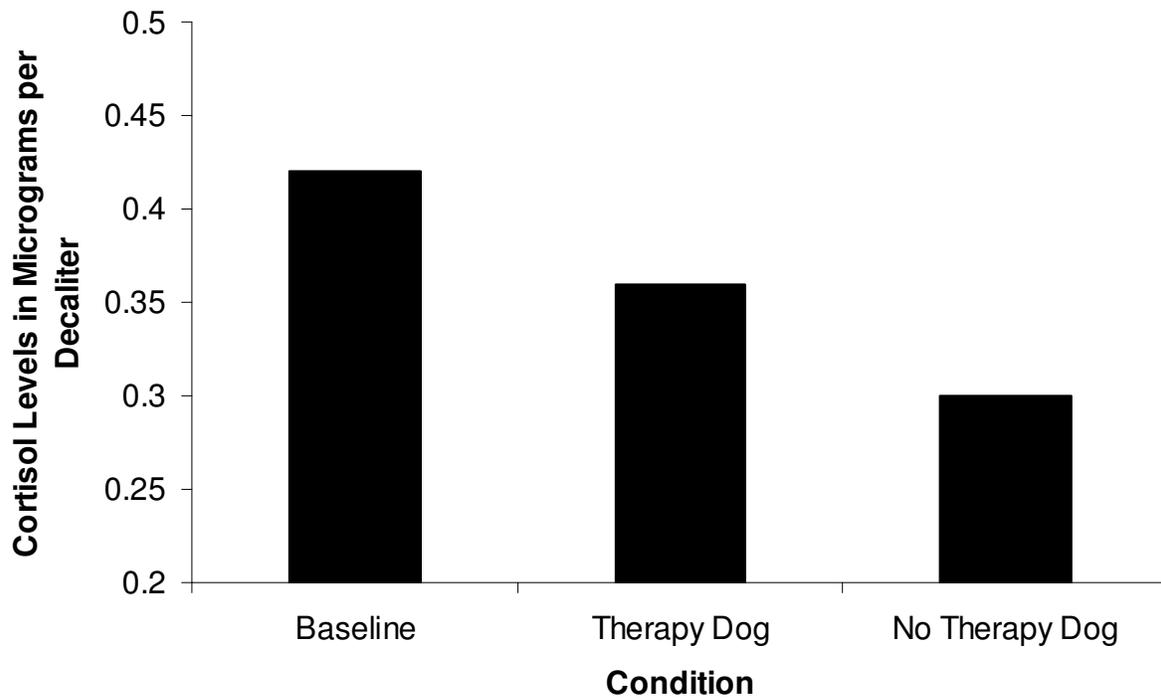
Figure 2. Mean cortisol levels (µg/dL) for baseline (*M* = .42), therapy dog (*M* = .36), and

no therapy dog (*M* = .30) conditions. Higher levels are associated with an increase in

stress.
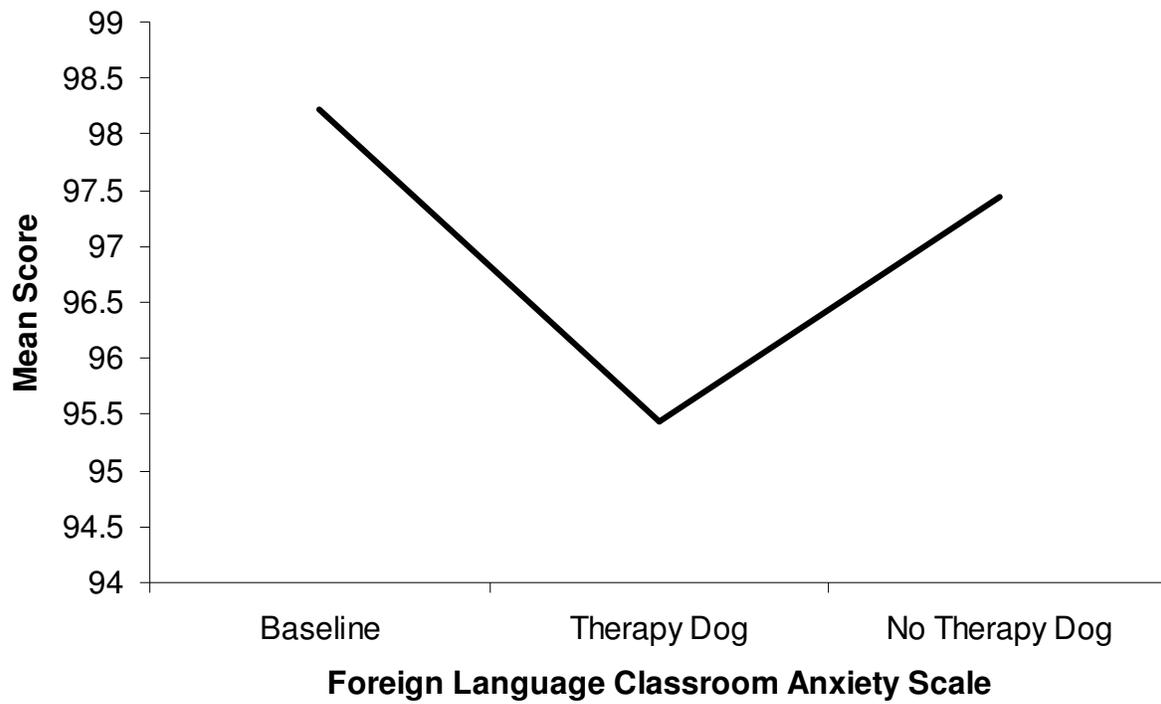
Figure 3. Foreign Language Classroom Anxiety Scale (FLCAS) scores for baseline

($M = 98.22$), therapy dog ($M = 95.44$), and no therapy dog ($M = 97.44$) conditions.

Higher scores indicate greater foreign language anxiety.
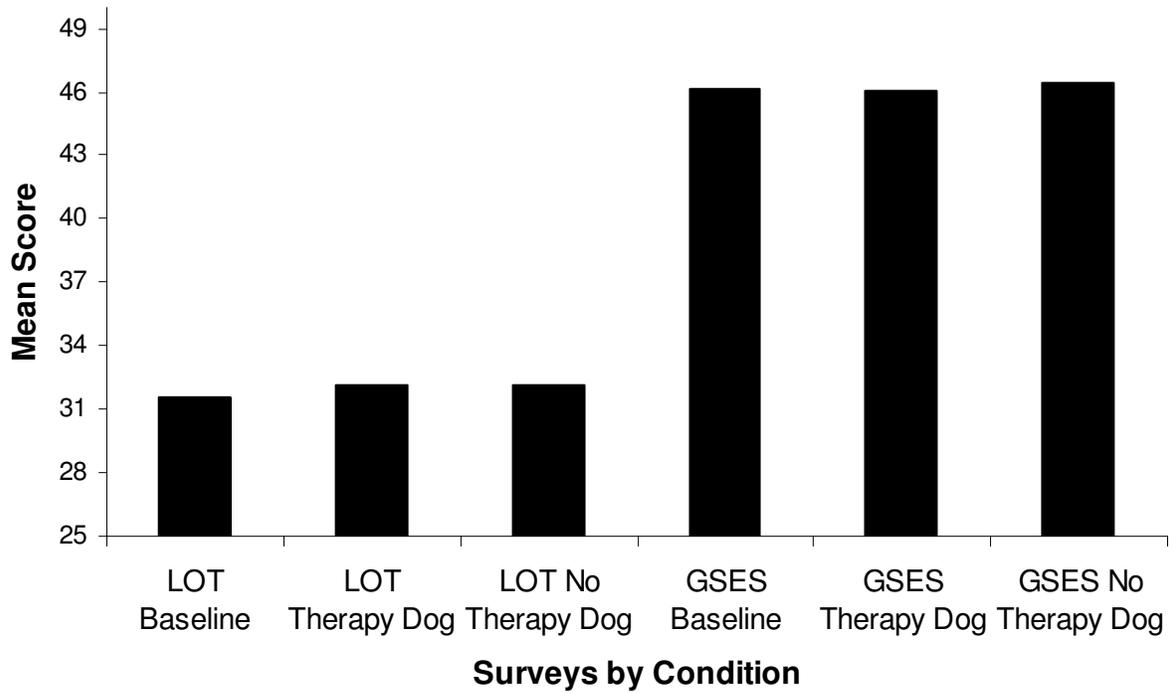
Figure 4. Life Orientation Test (LOT) and General Self-Efficacy Scale (GSES) mean

scores by condition.

Table 1.

Cortisol Levels (µg/dL) by Participant and Condition

Participant #	Baseline	Therapy Dog	No Therapy Dog
2	.270	.474	.311
3	.178	.251	.117
4	.300	.337	.329
5	.293	.381	.309
6	.492	.733	.202
7	.352	.591	.444
8	.185	.271	.383
9	.111	.224	.134
11	.579	.457	.415
12	.573	.334	.171
13	.859	**.263**	.675
14	.301	**.197**	.330
15	1.189	**.673**	.803
16	.397	.501	.111
17	.426	**.185**	.211
19	.244	**.172**	.193
20	.133	.123	.121
21	.686	.403	.183

Note. Participants with lowest cortisol levels during therapy dog condition are in bold

The Effect of Therapy Dogs on Spanish Second Language Learning
Human Participant Consent Form

1. This research will investigate the relationship between therapy dogs and Spanish L2 learning. Participants will be asked to learn several Spanish phrases during the 3 data collection periods. In some conditions, a therapy dog will be present. Students will complete several self-report surveys (e.g., demographic, stress, and personality) as well as a learning outcome measure or quiz as part of this study. In addition, participants will be asked to render a saliva sample to be used in a cortisol analysis at all three collection times.

2. As many as 30 undergraduate students will be recruited to participate.

3. The duration of the experiment will not exceed three (3) sessions and is expected to take up to forty-five minutes per session.

4. Participants will learn the Spanish phrases, complete the self-report measures, and render a saliva sample at the end of each of the three data collection periods.

5. Risks for participation are minimal, and participation is strictly voluntary. Those with any fears or allergies to dogs should note this on the screening questionnaire, should they decide to participate in the study. There is no penalty from withdrawing from the study. Students who choose not to participate will be given an alternate learning activity which can be completed in another classroom during the study time.

6. Extra credit may be available per instructor's policy. Expected benefits to this research are to gain insight about the process of learning a second language, to investigate how stress affects such learning, and to understand the influence of dogs on L2 learning. Each participant, if they so desire to contact the experimenter after the completion of the study, will receive an explanation of their results.

7. All data will be coded without the individual's name. No report or publication of the project will contain data that can be identified with any individual participant. Student names will not be available to Spanish instructors. Only the investigator and thesis advisor will have access to identifying data. All data will be stored on a computer with password protection.

8. For questions about the research, contact the principal investigator:
   Elaine M. Henry
   (423) 791-4564
   ehenry5@utk.edu

   Dr. Debora Baldwin, Thesis Advisor
   Department of Psychology, University of Tennessee-Knoxville
   dbaldwin@utk.edu

I have read and understood the information above. I consent to take part in this study. The researchers have answered my questions to my satisfaction. I understand a copy of this form is available upon request.

_____   _____

Participant's Signature   Date

_____

Print Name

_____   _____

Researcher's Signature   Date

The Effect of Therapy Dogs on Academic Stress and Spanish Second Language Learning

Demographics/Eligibility Questionnaire

1) Participant Number (please keep): _____

2) Course name, time, and instructor:_____

3) Year in College: Freshman   Sophomore   Junior   Senior   Other

4) Age:_____

5) Gender: M   F

6) Ethnicity: _____

7) What grade do you hope to achieve in the class for which you are participating?
_____

8) Are you a native Spanish speaker?   YES   NO

9) Does anyone in your household regularly speak Spanish? YES   NO

10) Have you ever lived, worked, or studied in a Spanish speaking country for *more than one (1) month?*   YES   NO
If yes, please list where:_____

11) Do you speak any other languages besides English and Spanish? YES   NO
     -if so, please list them:_____

12) How many years have you spoken any Spanish at any proficiency level?
_____

13) How did you primarily learn Spanish (home, class, other-please describe)?

_____

14) Are you completely at ease around friendly and well-trained dogs? YES   NO

15) Are you comfortable with all breeds and sizes of dogs?   YES   NO

16) If a dog were present, would you be likely to interact with him/her? YES   NO

17) Are you allergic to dogs?   YES   NO

18) Are you willing to participate in three separate task portions of this study?

                                                              YES   NO

Participation requirements are listed on the informed consent form. Please note, if you indicate yes to question 18, you are agreeing to participate in *all three (3)* phases of the study. You will only receive extra credit if you complete all conditions.

Thank you for your participation!

Elaine M. Henry, Primary Researcher

Foreign Language Classroom Anxiety Scale

Please write the number in the blank that best describes your feeling about each question. Base your response off of your most recent foreign language class. List class title and date taken here. Class_____Semester taken_____.
If you have never taken a foreign language class, give the response you believe would best represent your feeling if you were to find yourself in a foreign language class. Check here if you have never taken a foreign language class _____.

1=Strongly Disagree
2=Disagree
3= Neither Agree nor Disagree
4=Agree
5= Strongly Agree

1. I never feel quite sure of myself when I am speaking in my foreign language class.

_____

2. I do not worry about making mistakes in language class. _____

3. I tremble when I know that I am going to be called on in language class. _____

4. It frightens me when I do not understand what the teacher is saying in the foreign

language. _____

5. It would not bother me at all to take more foreign language classes. _____

6. During language class, I find myself thinking about things that have nothing to do with

the course. _____

7. I keep thinking that the other students are better at languages than I am._____

8. I am usually at ease during tests in my language class. _____

9. I start to panic when I have to speak without preparation in language class. _____

10. I worry about the consequences of failing my foreign language class. _____

11. I do not understand why some people get so upset over foreign language class.

_____

12. In language class, I can get so nervous I forget things I know. _____

45

13. It embarrasses me to volunteer answers in my language class. _____

14. I would not be nervous speaking the foreign language with native speakers. _____

15. I get upset when I do not understand what the teacher is correcting. _____

16. Even if I am well prepared for language class, I feel anxious about it. _____

17. I often feel like not going to my language class. _____

18. I feel confident when I speak in foreign language class. _____

19. I am afraid that my language teacher is ready to correct every mistake I make. _____

20. I can feel my heart pounding when I'm going to be called on in language class. _____

21. The more I study for a language test, the more confused I get. _____

22. I do not feel pressure to prepare very well for language class. _____

23. I always feel that the other students speak the foreign language better than I do. _____

24. I feel very self-conscious about speaking in the foreign language in front of other students. _____

25. Language class moves so quickly that I worry about getting left behind. _____

26. I feel more tense and nervous in my language class than in my other classes. _____

27. I get nervous and confused when I am speaking in my language class. _____

28. When I am on my way to language class, I feel very sure and relaxed. _____

29. I get nervous when I do not understand every word the language teacher says. _____

30. I feel overwhelmed by the number of rules you have to learn to speak a foreign language. _____

31. I am afraid that the other students will laugh at me when I speak the foreign language. _____

32. I would probably feel comfortable around native speakers of the foreign language. _____

33. I get nervous when the language teacher asks questions which I have not prepared in advance. _____

General Self-Efficacy Scale

Using the scale below, please select the number that best describes you and write that number in the blank.

1=Strongly Disagree
2=Disagree
3=No disagreement or no agreement (neutral)
4= Agree
5=Strongly Agree

1. If I make plans, I am convinced I will succeed in executing them. _____

2. If I have a failure the first time, I bite into it until it is going better. _____

3. If I absolutely want something, it usually goes wrong. _____

4. If I have the impression something new is complicated, I do not start it. _____

5. Even with unpleasant tasks I hold on until I am finished. _____

6. I have difficulties solving problems well in my life. _____

7. If I made a decision to do something, I will do it. _____

8. If I start something new, I soon have to have the idea I'm on the right track, otherwise I quit. _____

9. Unexpected problems make me quickly lose my balance. _____

10. If I make a mistake I try even harder. _____

11. I do not start learning new things if I think they are too difficult. _____

12. I doubt myself. _____

Life Orientation Test

Please use the scale below and write the appropriate number next to each statement listed to indicate the extent to which you personally agree with each item. Please note there are no correct or incorrect answers or opinions.

1=Strongly Disagree
2= Disagree
3=Neutral
4=Agree
5= Strongly Agree

1. In uncertain times, I usually expect the best. _____

2. It's easy for me to relax. _____

3. If something can go wrong for me, it will. _____

4. I always look on the bright side of things. _____

5. I'm always optimistic about my future. _____

6. I enjoy my friends a lot. _____

7. It's important for me to keep busy. _____

8. I hardly ever expect things to go my way. _____

9. Things never work out the way I want them to. _____

10. I don't get upset too easily. _____

11. I'm a believer in the idea that "every cloud has a silver lining". _____

12. I rarely count on good things happening to me. _____

Learning Outcome Measurement

Condition 1

Directions: You have just listened to an expert pronounce the following paragraph three times. Please 1) Stand and read the paragraph. The experimenter will be audio recording you as you do so. 2) After you have finished reading the paragraph, please give a brief summary of what the sentences mean.

El jardín puebla el triumfo de los pavos-reales.

Palanchina, la dueña dice cosas banales,

Y, vestido de rojo, pirueta el bufón.

La princesa no ríe, la princess no siente;

La princesa persigue por el cielo de Oriente

La libélula vaga de una vaga ilusión.

Learning Outcome Measurement

Condition 2

Directions: You have just listened to an expert pronounce the following paragraph three times. Please 1) Stand and read the paragraph. The experimenter will be audio recording you as you do so. 2) After you have finished reading the paragraph, please give a brief summary of what the sentences mean.

La princesa está triste . . qué tendrá la princesa?

Los suspiros se escapan de su boca de fresa,

que ha perdido la risa, que ha perdido el color.

La princesa está pálida en su silla de oro,

está mudo el teclado de su clave sonoro;

y en un vaso alvidada se desmaya una flor.

Learning Outcome Measurement

Condition 3

Directions: You have just listened to an expert pronounce and translate the following paragraph three times. Please 1) Stand and read the paragraph. The experimenter will be audio recording you as you do so. 2) After you have finished reading the paragraph, please give a brief summary of what the sentences mean.

Piensa acaso e el príncipe de Golconda o de China,

o en el que ha detenido su carroza argentina

para ver de sus ojos la dulzura de luz?

O en el rey de las Islas de las Rosa fragantes,

o en el que es soberano de los claros diamantes

o en dueno orgulloso de las perlas de Ormuz?

Likert Scale for Evaluators (phonological learning)

Please listen to the recording of each participant's pronunciation of the six target

phrases **<u>twice</u>**, then use the following scale to assign one score to each participant.

Please note that each participant should receive only one score and that it should

represent their average performance on all of the phrases. Each participant will get a

separate score for each of the conditions.

1   uninterpretable as target sound

2   correct target sound, very strong (non native) accent

3   correct target sound, noticeable (non native) accent

4   correct target sound, slight (non native) accent

5   indistinguishable from a native speaker's pronunciation

VITA

Elaine Maralee Henry earned her Associate of Science degree, *Summa Cum Laude*, from Northeast State Community College (Blountville, TN) in 2008. She had concentrations in nursing, speech communication, and psychology. While at Northeast State, Elaine graduated with a 4.0 GPA and was selected as Outstanding Student of the Year for 2008, Outstanding Student in Nursing, All-Tennessee Academic Team member, and Who's Who in American Junior Colleges. Additionally, she served as President of the college's Phi Theta Kappa Honor society chapter *Alpha Iota Chi* and President of *A Toast to Education* Toastmasters club. She holds Advanced Communicator Bronze and Advanced Leader Bronze certifications from Toastmasters International. In 2008, Elaine was named as one of the top 25 outstanding chapter officers for Phi Theta Kappa at the International level and had two works of fiction published in the Tennessee Region Literary Anthology.

Elaine graduated *Magna Cum Laude* from Maryville College in 2011 with a Bachelor of Arts degree in psychology. She served as a Maryville College Ambassador and was named the recipient of the College's Outstanding Achievement Award in Spanish for 2010. Her undergraduate thesis explored the effect of age of Spanish second language acquisition on pronunciation and phonological proficiency. Elaine is a member of *Psi Beta, Psi Chi, Phi Theta Kappa, Phi Kappa Phi,* and *Omicron Delta Kappa* honor and leadership societies.

In 2011, Elaine accepted the position of Graduate Teaching Assistant at the University of Tennessee, Knoxville, where she will complete her Master of Arts degree in Experimental Psychology in May 2013. Elaine has been accepted to the Ph.D.

program at UTK for fall 2013. Additionally, she is a part time English as a Second

Language (ESL) instructor at Maryville College.

Elaine is involved with American Kennel Club conformation dog show events and

Therapy Dog International work with her Bernese Mountain Dog. She is a member of

the Kentuckiana Bernese Mountain Dog Club and grooms working and sporting breeds

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