



LEADERSHIP SKILLS AND STRESS

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LEADERSHIP SKILLS AND STRESS

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## ABSTRACT

The present study induced stress in order to examine the relationship between leadership skills and stress. The study evaluated leadership skills, personality, and affect in order to measure the differences between perceived stress and physiological stress. Physiological stress was measured by salivary Cortisol samples that were taken before and after the stressor. The participants were exposed to the Trier Social Stress Test (TSST) as the stressor. A stepwise regression found that the personality factor, Neuroticism, was a significant predictor of Cortisol reactivity ( $R^2 = .081$ ,  $F(1, 68) = 5.966$ ,  $p < .05$ ) and self-reports of stress ( $R^2 = .057$ ,  $F(1, 68) = 4.113$ ,  $p < .05$ ). These findings suggest that individuals who are high in neuroticism might not be the best candidates for high stress jobs or workplaces.

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## INTRODUCTION

Over the past several decades, organizations and their leaders have become more concerned with stress in the workplace due to the many negative consequences it may have. According to a report by the American Psychological Association (2011), 36% of employees report feeling tense or stressed throughout their workday. Additionally, those employees with high levels of stress were more likely to report being unhappy with their job. Occupational stress has the possibility to affect employees at any level but it may be even more detrimental for those employees in leadership positions.

Given the importance of understanding stress in the workplace, the following study evaluated leadership skills, personality, and affect in relation to both perceived stress and physiological stress. Physiological stress was measured by salivary Cortisol samples that were taken before and after the stressor. The participants were exposed to the Trier Social Stress Test (TSST) as the stressor. This method consists of a public speaking task and an arithmetic task that are performed in front of confederate judges. The relationships between leadership skills, personality, perceived stress, and physiological stress were examined.

### **Stress**

Hans Selye (1936) discovered that stress can be experienced in two ways, negatively (distress) or positively (eustress). Positive stress can be the result of events such as marriage, promotions, winning money, making new friends, or a rapidly approaching graduation. Distress, on the other hand, might be the results of events such as divorce, injury, losing a job, or general work difficulties. The experience of stress is largely determined by the perception of the person experiencing it. Two people can actually experience the same stressor in different ways due to differing perceptions of the event (Roseman and Smith,



2001). For example, if two people go skydiving, both people can have the same physiological arousal but have different perceptions of the stress of the event; one person could have thought it was the scariest moment of their life and the other could have loved the thrill. This highlights the importance of obtaining self-reports of stress levels from participants in order to separate the subjective emotional stress experience (stress perception) from the physiological arousal (Cortisol reactivity). A stress perception is measured by self-reports from the person who experienced or is experiencing a stressor. Self-reports can be written, given in survey form, verbally given, or displayed using Visual Analog Scales.

Literature supports the idea that one factor that may play a role in the experience of stress is sex. Kring and Gordon (1998) found that men are less emotionally expressive and more physiologically aroused than women, even though self-reports of stress were the same. Estrogen may be the regulating factor between male and female reactivity to Cortisol (Kirschbaum, Kudielka, Schommer, & Hellhammer, 1999). Kanjantie (2006) found that contraceptives containing estrogen actually reduce HPA axis function by stimulating the synthesis of corticosteroid-binding globulin. Thus, the following hypothesis is proposed:

*Hypothesis 1:* Females will produce more Cortisol between Time 1 and Time 2 samples.

When under perceived stress, the body produces Cortisol and adrenaline through the hypothalamic–pituitary–adrenal axis (HPA; Bear, Connors, & Paradiso, 2016). Having the HPA axis run uncontrolled in the body for long periods of time affects the body and immune system negatively (Bear, Connors, & Paradiso, 2016). It takes approximately 10-15 minutes for increased levels of Cortisol to be detectible in saliva. There are significant advantages to using saliva samples for research, such as it is noninvasive and samples can be stored for

long periods of time; however, it is impacted by the natural circadian rhythm of Cortisol (Diebig, & Rowold, 2015).

The long-term activation of the stress-response system and the consequent overexposure to Cortisol and other stress hormones can disrupt almost all bodily functions. According to the Mayo Clinic (2016), there is an increased risk of numerous health problems, including: anxiety, depression, digestive problems, headaches, heart disease, sleep problems, and weight gain. Stress from an individual's job not only impacts their own health, it also impacts their home life. Schieman, Milkie, and Glavin (2009) found that individuals who are more educated and have more responsibility experience more frequent work interference in their personal lives than people who do not. They coined this as 'the stress of higher status.' Of course, there are many benefits to being in a higher status positions but there is a downside of work interfering with personal life (Schieman, Milkie, & Glavin, 2009).

### **Affect**

Another form of self-reporting about stress is to measure affect. Affect is the experience of feelings or emotions (Hogg, Abrams, & Martin, 2010). Affect can generally be divided into two factors: positive and negative. Positive Affect (PA) reflects the extent to which a person feels enthusiastic, active, and alert. High PA is characterized by a state of high energy, full concentration, and pleasurable engagement, while low PA is described as sadness and lethargy (Watson, Clark, & Tellegen, 1988). Negative Affect (NA) includes a variety of mood states, including anger, contempt, disgust, guilt, fear, and nervousness. It is mainly a facet of subjective distress and unpleasurable engagement (Watson, Clark, & Tellegen, 1988). Trait PA and NA roughly correspond to extraversion and anxiety/neuroticism, respectively (Tellegen, 1985; Watson & Clark, 1984 as cited in Watson,

Clark, & Tellegen, 1988). Watson, Clark, and Tellegen (1988) found that NA is linked to self-reported stress and poor coping skills. Positive and negative affect are another form of subjective response to stress (Hogg, Abrams, & Martin, 2010).

*Hypothesis 2: Negative Affect will be related to higher amounts of stress*

## **Leadership**

According to a study by Campbell, Baltes, Marin, and Meddings (2007), 88% percent of leaders said that work is a primary source of stress in their lives and that having a leadership role only increases the amount of stress they experience. They found that as the number of burdens placed upon leaders increases, so does the amount of stress. The tasks that most frequently cause stress for these leaders are relationship building, dealing with conflict, decision making, job responsibilities, developing people and managing limited resources. Many participants also found physical demands such as travel, work hours and the work environment exacerbating their levels of stress.

A study looking into the relationship between stress and leadership roles by Sherman, Lee, Cuddy, Renshon, Oveis, Gross, and Lerner (2012) found that leaders actually produced less Cortisol than non-leaders when measuring salivary Cortisol and anxiety reports. They proposed that leaders experience less stress due to a sense of control which has a stress sheltering effect (Kirschbaum, Prussner, Stone, Federenko, Gaab, Schommer, & Hellhammer, 1995). Although, instead of inducing stress or taking samples at work, participants only took one salivary sample at the time of coming into the lab. Their participant sample was interesting because it was members enrolled in an executive education program at Harvard University. Instead of measuring leadership skills directly, the participants were asked if they manage people at their job; anyone who said yes was

considered a leader. However, there is controversy in research about the difference between leadership and management. According to Kotter (1990) managers seek to produce predictability and order while leaders seek to create organizational change. There is a time and place where each of these priorities is most appropriate. An organization that is growing and becoming more complex needs a manager but organizations with dynamic external environments and uncertainty need leaders. There are always situational factors for each individual that impact when it is most appropriate to focus on leadership or management. Yukl and Lepsinger (2004) say the difference is that managers value stability, order, and efficiency, while leaders value flexibility, creativity, and adaptation. Even though Sherman, et al., (2012) study had the same components as the current study, the way that the variables were measured makes these studies completely different.

Transformational Leadership is currently one of the most popular approaches the leadership (Bass & Riggio, 2006). This study focuses on it because it is one of the most empirically supported theories and the skills can be trained (Bass & Riggio, 2006). Judge and Piccolo (2004) conducted a meta-analysis and found that Transformational Leadership facilitates the development of interpersonal relationships with helpful effects on subordinate job satisfaction, motivation, job performance, and group or organization performance. Transformational Leadership focuses on the charismatic and affective elements of leadership. This style of leadership develops followers' capabilities and intrinsic motivation. Transformational leaders push their followers to accomplish more than is what usually expected of them (Northouse, 2016). This leadership style requires high levels of communication from leaders in order for followers to meet goals and enhance productivity or efficiency. Leaders focus on the big picture within an organization and delegate smaller tasks

to the team to accomplish goals. Transformational leaders obtain the support of subordinates by inspiring followers to identify with a vision that reaches beyond their own immediate self-interests (Judge & Bono, 2000). There are four key components of Transformational Leadership: Idealized influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration (Northouse, 2016).

Idealized Influence involves behaviors in which the leaders are role models for their followers, such that their followers want to emulate them (Northouse, 2016). This is thought to be the most important dimension of Transformational Leadership (Judge & Bono, 2000). Idealized Influence is composed of two constructs: an attributional component and a behavioral component. The attributional component refers to the attributions of leaders made by followers based on perceptions they have of their leader, while the behavioral component refers to the followers' observations of their leader (Northouse, 2016).

Inspirational Motivation encompasses sharing a clear and appealing vision to followers (Judge & Bono, 2000). Someone who is skilled in this behavior has high expectations for followers and inspires them through motivation to become committed to the shared vision of the organization (Northouse, 2016). This leadership behavior enhances team spirit.

Intellectual Stimulation is when a leader fuels creativity and innovation to challenge beliefs held by subordinates as well as the organization (Northouse, 2016). Thinking outside of the box to solve typical or novel problems is encouraged by leaders who practice this skill. Followers are encouraged to question the status quo (Judge & Bono, 2000).

Individual Consideration is when leaders provide a supportive climate and listen to the needs of their followers. Leaders can use delegation to help followers grow in the

business and at home. A leader who gives distinct attention to each of their employees in a unique and caring way displays this skill (Northouse, 2016).

Transformational Leadership theory is a behavioral theory and therefore bases its concepts on factors that can be learned (Bass, 1998). Fuller, Patterson, Hester, and Stringer (1996) performed a meta-analysis that found that transformational leadership correlates with leader effectiveness, even when transformational leadership and effectiveness are measured independently ( $p = .34$ ).

Within the literature, there is evidence that some leadership traits or behaviors may have a genetic component. Arvey, Rotundo, Johnson, Zhang, and Mcgue (2006) found that in male twins 30% of the variance in leadership role occupancy could be accounted for by genetic factors. Arvey, Zhang, Avolio, and Krueger (2007) replicated the study with female twins and found that 32% of the variance in leadership role occupancy for women was accounted for by genetic factors. While this was a significant finding, it leaves approximately 70% of the variance to other factors, meaning that possibly training or experiences could make people more likely to be leaders. Bass (1998) found that the factors of transformational leadership can be taught. Thus, if any of the facets of Transformational Leadership can protect leaders against stress, it would be valuable for organizations to train leaders in those skills. Based on the research on leadership and stress, the following hypothesis is proposed:

*Hypothesis 3:* Participants with high leadership skills will have smaller Cortisol reactivity.

*Hypothesis 4:* Participants with high leadership skills will have a lower self-reports of stress perception.

## Personality

Personality is often conceptualized using the Five-Factor Model (FFM) of Personality, or commonly called the Big 5. It gives a set of broad dimensions that characterize individual differences. This conceptualization is based on five personality factors: Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Openness to experience is the tendency to be creative, imaginative, perceptive and thoughtful. Conscientiousness can be broken down into two parts: achievement and dependability. Extraversion is the tendency to be outgoing, assertive, active, and excitement seeking. Agreeableness is the tendency to be gentle, kind, trusting, and trustworthy. Neuroticism is the tendency to be anxious, fearful, depressed, and moody (Judge & Bono, 2000).

**Personality and Leadership.** Research has been conducted examining how personality factors are related to leadership. Judge and Bono (2000) looked at the link between personality and transformational leadership behavior. They found that Agreeableness was the strongest and most consistent predictor of transformational leadership ( $r = .27, p < .01$ ). Extraversion and Openness to Experience were significantly correlated with transformational leadership at  $r=.22$  and  $r=.20$  respectively. Neither Neuroticism nor Conscientiousness was found to be significantly related to transformational leadership.

Judge, Bono, Ilies, and Gerhardt (2002) conducted a meta-analysis from 222 correlations of 73 samples and found that personality factors and leadership are generally correlated as follows: Extraversion ( $r= .31$ ), Conscientiousness ( $r= .28$ ), Openness to experience ( $r= .24$ ), Neuroticism ( $r= -.24$ ), and Agreeableness ( $r=.08$ ). They found that across

studies, Extraversion and Conscientiousness were most related to leadership. The following hypotheses are proposed regarding the role of personality in leadership and stress:

*Hypothesis 5:* Controlling for personality, participants with high leadership skills will still have a lower stress perception.

**Personality and Stress.** Increased Neuroticism is linked to emotional instability. Emotional instability can make situations seem more stressful than they are. Bolger and Schilling (1991) found that participants with high neuroticism were more emotionally distressed than participants with low neuroticism scores. The reactivity to stressors accounted for twice as much of the reported distress difference as the actual exposure to stressors.

Gunthert, Cohen, and Armeli (1999) found that cognitive appraisals help explain the chronic negative affectivity that is associated with neuroticism. Participants completed questionnaires for 14 consecutive days. Participants with high neuroticism reported more interpersonal stressors and had more negative cognitive appraisals and reacted with more distress than individuals with low neuroticism. They also found that participants with high neuroticism had less effective coping strategies such as a hostile reaction.

Schneider (2004) conducted a study looking at the role of neuroticism on psychological and physiological stress responses. She found that high neuroticism and low agreeableness were related to threat appraisals in the study. The results exhibited that personality accounted for 26% of the variance in appraisals, with neuroticism predicting more threat. Appraisals, negative affect, and neuroticism were all correlated.

*Hypothesis 6:* Participants with high Neuroticism will have higher stress perceptions and physiological reactions to stress.



## METHOD

### Participants

Data were collected from 70 participants, 25 males, 45 females, with a mean age of 19.6. Participants were collected from a southwestern regional state university's psychology participant pool. Participants received a course requirement and/or receive extra credit in a psychology course in exchange for participating in the study. Participants were asked to complete a demographic form as well as self-screening with the SONA ad online and orally confirmed the information once they arrived at the lab, for health issues that affect anxiety and hormone production. Consistent with local demographics, a majority (50.7%) of participants were Caucasian, 40.8% reported Hispanic or Latino ethnicity, while 8.5% reported other ethnicities. 30 participants (42.9%) were Freshman, 17 (24.3%) were Sophomores, 13 (18.6%) were Juniors, 9 (12.9%) were Seniors, and 1 participant (1.4%) was a High School Dual Credit student. 57 out of 70 (81.4%) said that they did play a sport during high school or college. 20% of the participants majored in Psychology, the second highest amount of participants majored in Nursing (14.3%). Refer to Table 1 and Table 2 for all participant majors and minors.

The participants were asked how if they viewed themselves as a good leader on a scale from 1 to 5. The average for all participants was 3.91. Table 3 shows the frequency for all participants. 82% of all participants said that they had previously had a leadership position, however most said that they had only had 1 (21.4%) or 2 (21.4%). See Table 4 for all participant data on self-reports of leadership.

Cevada, Vasques, Moraes, and Deslandes (2014) found that physically active individuals should present with lower Cortisol levels. Georgopoulos, Rottstein, Tsekouras,

Theodoropoulou, Kouk-kou, Mylonas, Polykarpou, Lampropoulou, Iconomou, Leglise, Vagenakis, and Markou (2011) found that female athletes had a greater response to stress than male athletes. In the present study, 57 out of 70 (81.4%) participants said that they did play a sport during high school or college. However, in this study, there was no difference in the means for self-reports of stress or Cortisol for participants who played a sport compared to ones who did not.

In order to compare results from Sherman, et al. (2012), three demographic questions were asked. 62% of all participants said that they had previously had a job, but only 19% said that they had a leadership position at their job. Out of that 19% percent or 19 out of 70, only 14 (20%) said that they managed people. See Table 5 for all data relating to these questions. A one-way ANOVA was used to compare the means of managers against all of the stress measurements in the study. There were no statistically significant differences in any of the stress or affect measures based on participants in a leadership role who managed others,  $F(1,68) = .02, p > .05$  for Cortisol difference, and  $F(1,68) = .12, p > .05$  for self-reports of stress.

## **Procedure**

Participants were only selected to participate in the late afternoon due to the natural circadian rhythm of Cortisol (Kirschbaum, Pirke, & Hellhammer, 1993; Childs, Vicini, & De Wit, 2006; Birkett, 2011). When participants arrived for the study they were be greeted by the researcher, told a brief overview of the procedure, and given the informed consent document. Once the participant provided consent, the experimenter delivered the pre-task questionnaires, which included the demographic survey, leadership inventory, personality inventory, STAI-Short Form (to measure perceived stress), and the PANAS (to measure

affect; all measures are described in detail below). After completing the inventories, the participant was asked to give the first saliva sample. This served as the baseline for the Cortisol reactivity to the stressor. After the first saliva sample was taken, the participant participated in the experimental task, which was designed to induce stress. After the participant completed the stressful task, another saliva sample was obtained, and the participant completed the post-task measures of perceived stress and affect.

### **Experimental Task**

The method of inducing stress used in the present study is the Trier Social Stress Test (TSST). What sets the TSST apart from other stress inducing tasks is that it is an extremely standardized assessment using anticipation, public speaking, and mental arithmetic (Kajantie, 2006; Kirschbaum, Pirke, & Hellhammer, 1993; Childs, Vicini, & De Wit, 2006; Birkett, 2011). The task has a 5-minute preparatory period for the participant in order to give an impromptu speech about why they are a good candidate for their ideal job. The participant is left alone to think about their speech and given note cards if they would like them. After being walked into another room where confederate judges are waiting, the participant's notes are unexpectedly taken away from them. The speech is given in front of two or three confederate judges who maintained neutral facial expressions during the tasks. Judges were either two females or a male and female. The participant was required to speak for the entire 5-minute period. If the participant remained silent for approximately 20 seconds the judges prompted them with the statement: "You still have time remaining, please continue."

Once the 5-minute speaking task was complete, a 5-minute arithmetic task started. During this portion of the task, the participant was asked to count backwards sequentially from 1,022 by sets of 13. If the participant provided an incorrect answer, the judges asked

them to start again from 1,022. (Kirschbaum, Pirke, & Hellhammer, 1993; Childs, Vicini, & De Wit, 2006; Birkett, 2011). After the task was over, the participant was told that the judges would evaluate their performance while the participant completes some forms in the other room. The participant was given the STAI-short form (to measure perceived stress) and PANAS (to measure affect) for the second time once they have left the room. Ten minutes after the participant had left the room, the participant provided another saliva sample and was debriefed. The ten-minute wait period is imperative because that is how long it takes for the Cortisol produced from the HPA axis to be present in saliva (Kajantie, 2006; Kirschbaum, Pirke, & Hellhammer, 1993; Childs, Vicini, & De Wit, 2006; Birkett, 2011).

The reason that the TSST creates an expected Cortisol response in all participants is due to ego involvement, social-evaluative judgment by others, and uncontrollability of the situation (Kajantie, 2006). The TSST is considered to have high ecological validity. This means that it is applicable to and resembles conditions encountered in everyday life (Kajantie, 2006). The type of stress experienced is nothing more than a student would experience when giving a class presentation or speaking up during an important meeting.

## **Measures**

**Perceived Stress.** Stress was assessed using the short form of the State-Trait Anxiety Inventory (Marteau & Bekker, 1992). This measure is used to evaluate the level anxiety felt in the present moment. When compared with the full-form of the STAI which is 40 questions, the six-item version offers a brief and acceptable scale for subjects. Items were answered on a Likert scale of 1 (*Not at All*) to 4 (*Very Much*). Tluczek, Henriques, and Brown (2009) found that this form had internal consistency reliabilities greater than .90 and

was a better fitting model across time points than other versions of the short form that used different questions. This form was used to save time and energy for the participants.

**Physiological Stress.** In order to evaluate the physiological stress response, salivary Cortisol samples were taken before and after the Trier Social Stress Test. Salivary Cortisol samples were evaluated using Salimetrics Salivary Cortisol ELISA Kits. Samples were analyzed in Dr. Floyd Huang's Lab in the ASU Physical Therapy Department in accordance with the Salimetrics Protocol manual.

**Leadership.** In order to assess transformational leadership qualities, participants completed a 40-item Transformational Leadership measure (Reichard, Riggio, & Smith, 2009). This measure evaluates the four factors related to transformational leadership. Idealized Influence was assessed using 10 items, Inspirational Motivation subscale was 12 items, while nine items were included to assess Individualized Consideration, and Intellectual Stimulation was assessed based on nine items. Items are answered on a Likert scale of 1 (*Very strongly disagree*) to 7 (*very strongly agree*).

**Personality.** Personality is conceptualized using the Five Factor Model (FFM or the Big 5) which summarizes an individual's personality using five broad dimensions: Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. The present study measured personality using the 50-item International Personality Item Pool (IPIP) representation of the Goldberg (1992) markers for the Big-Five factor structure (International Personality Item Pool; Goldberg, 1999; Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger, & Gough, 2006). Participants are told to describe themselves as they generally are now, not as they wish to be in the future. Items are answered on a scale of 1 (*Very Inaccurate*) to 5 (*Very Accurate*).

**Affect.** Participant affect was assessed using a 20-item Positive Affectivity Negative Affectivity Scale (PANAS; Watson, Clark, & Tellegen, 1988). This scale consists of 10 adjectives each addressing positive and negative affect. Sample positive items include “Proud” and “Enthusiastic” while negative items include “Upset” and “Frustrated”. Participants rate the extent they feel that emotion at that moment using a 5-point Likert ranging from 1 (*Very slightly or not at all*) to 5 (*Extremely*). The positive and negative items are then summed separately to provide an overall measure of positive and negative affect respectively.

### **Salivary Cortisol Analysis**

Salivary Cortisol was analyzed using the Salimetics Expanded Range High Sensitivity Salivary Cortisol Enzyme Immunoassay Kit Protocol Manual. After samples were collected, they were stored in a freezer at -20°C. On the day of the assay, samples were thawed to room temperature and refrigerated again once they were analyzed. The Salivary Cortisol ELISA Kit is a competitive immunoassay kit. It comes with a Microtitre Plate coated with monoclonal anti-Cortisol antibodies, Cortisol standards and controls, Cortisol Enzyme Conjugate, Assay Diluent, Wash Buffer Concentrate, TMB Substrate Solution, and Stop Solution. Other supplies needed to run the analysis are precision pipettes in 15 and 25  $\mu\text{L}$ , precision multichannel pipette in 50  $\mu\text{L}$  and 200  $\mu\text{L}$ , a vortex, a plate rotator capable of 500 rpm, a plate reader with 450 nm and 490nm reference filters, a centrifuge capable of 1500 x g, deionized water, and one disposable polypropylene tube to hold at least 24 mL.

The Salimetics Expanded Range High Sensitivity Salivary Cortisol Enzyme Immunoassay Kit Protocol Manual listed the following method for analyzing Cortisol. The Cortisol standards and samples are pipetted into the specific wells on the microtitre plate.

The Cortisol in the standards and samples compete with Cortisol conjugated to horseradish peroxidase for the antibody binding sites in the microtitre plate. After the hour long incubation period, the unbound components are washed away using the wash buffer. The bound Cortisol Enzyme Conjugate that is left behind on the wells of the plate is measured by evaluating the reaction of the horseradish peroxidase enzyme to the substrate tetramethylbenzidine (TMB). The reaction can be observed because it produces a blue color. A yellow color is formed after stopping the reaction with the stop solution due to its acidity. The optical density of this reaction is read on a standard plate reader at 450 nm. How the plate reader can detect the amount of Cortisol in the sample is due to the amount of Cortisol Enzyme Conjugate detected. The amount of Cortisol Enzyme Conjugate is inversely proportional to the amount of Cortisol present in the sample (Salimetics Expanded Range High Sensitivity Salivary Cortisol Enzyme Immunoassay Kit Protocol Manual, 2016).

## RESULTS

Prior to conducting analyses, the data were screened for missing data and adherence to assumptions, namely normality, freedom from outliers, and impossible data points. The original sample consisted of 71 participants; however, one case was removed due to being an outlier as indicated by a Z-score above 3.3 (Warner, 2013).

Following screening of the data, bivariate correlations for the scales and sub-scales were examined. See Table 7 for all correlations. As expected, Leadership Total Score correlated with Agreeableness ( $r = .54$ ,  $p < .01$ ), Conscientiousness ( $r = .47$ ,  $p < .01$ ), Openness to Experience ( $r = .41$ ,  $p < .01$ ), Extroversion ( $r = .36$ ,  $p < .01$ ), and Neuroticism ( $r = .25$ ,  $p < .05$ ).

### Cortisol

Pre-TSST Cortisol samples averaged  $0.169 \mu\text{g/dL}$  while Post-TSST Cortisol samples averaged  $0.273 \mu\text{g/dL}$ . Pre-TSST Cortisol samples ranged from  $0.051 \mu\text{g/dL}$  to  $0.551 \mu\text{g/dL}$ . Post-TSST Cortisol samples ranged from  $0.037 \mu\text{g/dL}$  to  $1.272 \mu\text{g/dL}$ . According to the Salimetrics Protocol manual typical adult males' average  $0-0.308 \mu\text{g/dL}$  and typical adult females' average  $0-0.359 \mu\text{g/dL}$  in the afternoon (Aardal & Holm, 1995). Women are typically more reactive to Cortisol changes, however, in this study males averaged  $M = .203 \mu\text{g/dL}$  while females averaged  $M = .047 \mu\text{g/dL}$ .

In order to test Hypothesis 1, a one-way between subjects ANOVA was conducted to compare gender differences against the Cortisol difference between time 1 and time 2. This difference is called Cortisol Reactivity. There was a significant gender difference in cortisol



reactivity between Time 1 and Time 2  $F(1,68) = 12.16, p < .001$ . Means showed that males averaged .40  $\mu\text{g/dL}$  while females averaged .20  $\mu\text{g/dL}$ . Hypothesis 1 was not supported.

Because participants either had two female judges or one male and one female judge, an one-way between subjects ANOVA was ran to compare these two groups. Female participants did have a significant increase in Cortisol levels when they had mixed gender judges while males did not  $F(1,68) = 11.183, p < .001$  (reference Table 10).

### **Leadership**

There was not a significant relationship with Transformational Leadership skills and Cortisol, thus Hypotheses 3 and 4 were not supported. For all correlations, see Table 7. The ANOVA found no significance with any of the three stress outcome variables, Cortisol  $F(15,54) = .50, p > .05$ , self-reports of stress,  $F(15,54) = 1.77, p > .05$ , and negative affect,  $F(15,54) = .788, p > .05$ , see Table 8. Regression with and without accounting for personality were performed,  $R^2 = .16, p > .05$ , and,  $R^2 = .00, p > .05$  respectively, see Table 9 and Table 10.

### **Personality**

Hypothesis 5 was not supported by any of the data evaluating personality. Hypothesis 6 was partially supported. Neuroticism had an inverse relationship with the self-reports of stress that was unexpected. Neuroticism was significantly related to Post STAI Stress and Cortisol Reactivity. Neuroticism correlated with Post STAI Stress ( $r = -.239, p < .05$ ) and Cortisol Reactivity ( $r = .284, p < .05$ ). Thus, as Neuroticism scores increase, Post STAI Scores decrease. Also, individuals who were higher on neuroticism tended to release a greater amount of cortisol.

There was no significance when evaluating leadership because a majority of the variance was accounted for by the personality factors. A stepwise regression was performed in order to assess what personality factors most succinctly predicted stress for this study. All predictors, the five factors of personality and the four components of transformational leadership, were added to the model to see what accounted for the most variance in the self-reports of stress and Cortisol reactivity. It was found that the personality factor, Neuroticism, was a significant predictor of Cortisol reactivity ( $R^2 = .081$ ,  $F(1, 68) = 5.966$ ,  $p < .05$ ) and self-reports of stress ( $R^2 = .057$ ,  $F(1, 68) = 4.113$ ,  $p < .05$ ). See Regression Tables 8 and 9 for more information.

### **Affect**

As a broad measure of stress perception, Affect was examined as well. Hypothesis 2 was supported by the relationship between negative affect and stress responses. Affect was analyzed using two categories, positive and negative. There were significant correlational relationships between post-task perceptions of stress and pre- and post- affect. The strongest relationship was Post Negative Affect ( $r = .728$ ,  $p < .01$ ), such that the higher the scores on post-task stress perceptions, the higher scores were for negative affect, as would be expected. See Table 7 for all correlations and Table 11 for all means of STAI Stress and Affect.

Pre PANAS Positive scores correlated with all four parts of Transformational Leadership as well as the overall score: Inspirational Motivation ( $r = .426$ ,  $p < .01$ ), Intellectual Stimulation ( $r = .241$ ,  $p < .05$ ), Individual Consideration ( $r = .384$ ,  $p < .01$ ), Idealized Influence ( $r = .263$ ,  $p < .05$ ), and Leadership Total ( $r = .410$ ,  $p < .01$ ). The Post PANAS Positive scores only correlated with Individual Consideration ( $r = .266$ ,  $p < .05$ ). There were no correlations between Affect and Cortisol reactions.

## DISCUSSION

This study investigated the relationship between Transformational Leadership skills, personality factors, and two reports of stress from the TSST: subjective – self-report experience of stress and physiological – salivary Cortisol levels. Contrary to expectations, there were no significant correlations or mean differences between Transformational Leadership scores and Cortisol Reactivity. As expected, there were significant relationships with Transformational Leadership among all five aspects of personality; Openness to Experience, Conscientiousness, Extroversion, Agreeableness, and Neuroticism.

While leadership skills did not predict differences in stress and Cortisol reactivity after a stressor, personality was a significant predictor. Specifically, with increased neuroticism there was an increase in Cortisol reactivity. This finding is consistent with the literature about neuroticism. Research has found that neuroticism is associated with a poor ability to cope with stress effectively or to regulate negative emotional states (Gross, Sutton, & Ketelaar, 1998). Indeed, neuroticism has been recognized as a moderating factor for various physiological stress reactions (Kennedy & Hughes, 2004; McCleery & Goodwin, 2001; Phillips, Carroll, Burns, & Drayson, 2005; Zobel et al., 2004, as cited in Mohiyeddini, Bauer, & Semple, 2015). Mohiyeddini, Bauer, and Semple (2015) found that within their male-only sample, participants who score high on neuroticism found the TSST task significantly more stressful than those who did not. Findings in the present study agree with Gunthert, Cohen, and Armeli (1999) who suggest that individuals who are high in neuroticism might not be the best candidates for high stress jobs or workplaces, due to their lack of coping skills that could protect them from the health and psychological impacts of chronic stress.

Interestingly, as neuroticism increased, self-reports of stress after the stressor decreased. This relationship could be due to impression management. Impression management is when people consciously control the impressions others form of them (Leary & Kowalski, 1990). The inverse relationship between neuroticism and the two stress measurements could be accounted for by this behavior. Uziel (2014) found a difference in cognitive appraisal in relation to neuroticism and impression management. In a public setting high neuroticism predicted a negative shift in appraisal while high impression management predicted a positive shift in appraisal.

In the present study, men exhibited significantly higher Cortisol levels and reactivity no matter the gender of the judges in the room. This difference can likely be attributed to emotional suppression. Avero and Calvo (1999) found a higher correlation between self-reports of anxiety and physiological arousal in women when compared to men. This difference was attributed to men using more emotion-suppressing coping strategies than women. This is driven by a conscious effort to protect one's self image and avoid vulnerable emotional states. Lam, Dickerson, Zoccola, and Zaldvar, (2009) also found stronger Cortisol reactivity in subjects who had higher emotional suppression. This is consistent with the findings of Kring and Gordon (1998) that men are less emotionally expressive and more physiologically aroused than women even though self-reports of stress were the same.

### **Limitations and Future Research**

The current study is limited in various ways, and the findings should be replicated. While the present study makes a number of contributions to the study of leadership and stress, some limitations should be noted. First, this study was conducted on college age students, some of whom have not held a job before, and many of whom have not held a leadership or

management position before. Some limitations of using an undergraduate population are that sleep deprivation, caffeine, and alcohol all increase Cortisol (Randall, 2010). These are all very normal things for undergraduates to participate in and might not be truthful when asked about them. Future research should use a population of adults in the workplace to compare Cortisol reactivity.

Another limitation is the difference between the instances of short term stress versus long term workplace stress in this study, as compared to “real life”. The TSST only accounts for one instance of stress, not what it would be like to be under that kind of stress all day, every day, in the workplace. Petrowski, Wintermann, & Siepmann (2012) studied Cortisol response to repeated psychosocial stress using the TSST method. They found a decrease in the salivary cortisol response following the repeated administration of the Trier Social Stress Test with 24 hours between two testing sessions, which is consistent with findings by Kirschbaum et al. (1995). They found that there were no significant differences in the HPA axis reactivity observed when the testing sessions were separated by a 10-week-interval. Armario et al. (2004) established that the stronger the experimental stressor, the greater the long-term desensitization of the HPA axis. They speculated that the desensitization of the HPA axis was the sum of two different phenomena, namely long-term effects and habituation-like processes (as cited in Petrowski, Wintermann, & Siepmann, 2012). This means that if someone is experiencing the same high stress job duties, there might not be an increase in perceived or physiological stress over time due to habituation of job duties. However, this concept should be studied further in order to find more information to aid in understanding the complex nature of workplace stress.

Gilissen, Bakermans-Kranenburg, van IJzendoorn, and Linting (2008) found genetic differences in response to the TSST when studying the neurophysiological stress reactivity in children, in relation to a specific genetic polymorphism (5-HTTLPR) that in previous studies has been shown to be associated with feelings of stress and anxiety and the serotonin transporter gene (5-HTT). These types of genetic differences were not accounted for and could be hard to take into account in any other setting but should be taken into consideration. Thus, future studies would do well to include this variable, in order to achieve a better understanding of their role in the leadership and stress process.

Additionally, this study examined gender differences in stress responses and Cortisol reactivity. The primary researcher for this study, however, was female. It is possible that there could be an interaction that could not be accounted for even with counterbalancing the gender of the judges. Future research could have a male as the primary researcher to see if this finding is consistent or only situational.

Future studies may do well to include an Emotional Regulation Style Inventory, an EEG to evaluate emotional cognition, or Emotional Intelligence assessments. Emotion is a variable that may help to explain some of the mechanisms by which leadership and stress are related, and these assessments could indirectly give more information about the Neurotic tendencies of participants.

Finally, more research should be done with regard to the application of affectivity in the workplace and how state or trait based affectivity may interact with leadership skills.

## **Implications**

The results of this study, taken with the findings of past research, have a number of interesting implications. First, males may be more likely than females to practice workplace impression management, particularly in regards to their emotions and possibly mental health. This is an important finding because women are often the only ones associated with strong negative emotions. Businesses should consider the emotional toll that impression management takes on male employees.

Additionally, the audience that someone is working with can impact how well a job is performed. In this study, women reported more stress than males in a mixed gender room. However, there are always background and situational factors that impact every situation. Situational factors influence perceived and physiological stress. As businesses become more diverse we will see differences in stress perception of men and women at work.

Overall, the results of this study suggest that when selecting candidates for high stress workplace positions, personality may be more important to consider than Transformational leadership skills or potential. Many businesses administer a personality test along with the employment application, and those that do not, probably should. A personality assessment can provide insights into a person that can help determine if they are the correct fit for an organization. While Judge and Bono (2004) found that Extraversion was the most important personality factor in predicting transformational leadership, the present study found that neuroticism was the most important factor in predicting a person's reaction to a stressful situation. Taken together, these findings suggest that businesses should consider how personality works with leadership and stress in their own workplace.

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## APPENDIX A

	Frequency	Percent
Accounting	1	1.4
Biology	8	11.4
Biology and Chemistry	1	1.4
Business	2	2.9
Business Management	2	2.9
Communication	3	4.3
Computer Science	1	1.4
Criminal Justice	3	4.3
Criminal Justice and Psych	1	1.4
English	1	1.4
Health Science Professions	1	1.4
Kinesiology	5	7.1
Mass Media	2	2.9
Math and Physics	1	1.4
Mathematics	1	1.4
Nursing	10	14.3
Pre-Med	1	1.4
Pre-Nursing	2	2.9
Psychology	14	20.0
Social Work	2	2.9
Special Education	1	1.4
Teaching	1	1.4
Theater	1	1.4
Undeclared	5	7.1

## APPENDIX B

	Frequency	Percent
Art	1	1.4
Broadcasting	1	1.4
Business	2	2.9
Chemistry	3	4.2
Criminal Justice	4	5.7
Education	1	1.4
English	1	1.4
Exercise Science	1	1.4
Geo Science	1	1.4
HPN	1	1.4
Kinesiology	2	2.9
Math	1	1.4
N/A	31	44.3
Political Science	1	1.4
Psychology	2	2.9
Psychology	11	15.7
Public Relations	1	1.4
Sociology	1	1.4
Spanish	3	4.3
Technical Writing	1	1.4



## APPENDIX C

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Table 3.  
Participants Self Rating of Leadership

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	Frequency	Percent
2.0	2	2.9
3.0	17	24.3
4.0	36	51.4
5.0	15	21.4

---

## APPENDIX D

Table 4.  
Participant Self Reports of Leadership Positions Held

	Frequency	Percent
Have you had a leadership position?		
Yes	58	82.9
No	12	17.1
How many?		
0	9	12.9
1	15	21.4
2	15	21.4
3	12	17.1
4	7	10.0
5	6	8.6
6	4	5.7
8	1	1.4
20	1	1.4

## APPENDIX E

Table 5.

## Participant Reports of Job and Management Positions Held

		Frequency	Percent
Do you have a job or have you ever been interviewed for a job?	Yes	62	88.6
	No	8	11.4
Do you hold any leadership positions at a place of employment?	Yes	19	27.1
	No	51	72.9
If yes, do you manage people?	Yes	14	20
	No	56	80

## APPENDIX F

Table 6.  
ANOVA Between Managers and Stress Measurements

	df	F	$\eta$	p
Post PANAS Positive	2	.497	0.014	.610
Post PANAS Negative	2	.495	0.014	.612
Post STAI Total	2	.415	0.012	.662
Post STAI Stress	2	1.914	0.054	.155
Pre Cortisol	2	.213	0.005	.809
Post Cortisol	2	.061	0.001	.914
Cortisol Difference	2	.068	0.002	.934

Note.  $p < .05 = *$ ,  $p < .01 = **$

APPENDIX G

Table 7.  
Bivariate Correlations between the Outcome Variables and Independent Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Leadership Total												
2. Extraversion	.360**											
3. Agreeableness	.538**	.378**										
4. Conscientiousness	.468**	.045	.168									
5. Neuroticism	.246*	.259*	.354**	.364**								
6. Openness to Experience	.405**	.205	.200	.441*	.226							
7. Post STAI Total	.018	.030	.153	.034	.089	-.026						
8. Post STAI Stress	-.005	-.140	.081	-.130	-.239*	-.103	.378*					
9. Cortisol Difference	-.077	.143	-.036	.094	.284*	-.084	.048	.023				
10. Pre PANAS Positive	.410**	.459**	.343**	.314**	.265*	.400**	.329**	-.038	-.014			
11. Pre PANAS Negative	-.283*	-.144	-.268*	-.280*	-.508**	-.072	.204	.288*	-.035	-.154		
12. Post PANAS Positive	.224	.197	.254*	.198	.140	.285*	.116	-.368**	.036	.240*	-.187	
13. Post PANAS Negative	.025	-.151	.009	-.069	-.043	-.131	.014	.728**	.146	-.068	.127	-.487**

Note.  $p < .05 = *$ ,  $p < .01 = **$

## APPENDIX H

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Table 8.  
ANOVA Between Leadership and Stress Measurements

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	df	F	$\eta$	p
Cortisol Reactivity	15	.501	.643	.967
Self-Report	15	1.778	.864	.110
Negative Affect	15	1.162	.807	.390

---

Note.  $p < .05 = *$ ,  $p < .01 = **$

## APPENDIX I

Table 9.

Summary of Stepwise Regression Analysis for Cortisol Reactivity  $\mu\text{g}/\text{DL}$  with Leadership and Personality

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Extraversion	.006	.004	.198	1.498	.139
Agreeableness	-.005	.006	-.128	-.864	.391
Conscientiousness	.006	.006	.146	.979	.331
Neuroticism	.008	.003	.301	2.246	.028
Openness to Experience	-.006	.005	-.169	-1.262	.212
Leadership	-.001	.001	-.153	-.942	.350

## APPENDIX J

Table 10.

Summary of Stepwise Regression Analysis for Cortisol Reactivity  $\mu\text{g/dL}$  with Leadership Only

---

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Leadership	-.001	.001	-.007	-.635	.527

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## APPENDIX K

Table 11.

Summary of Stepwise Regression Analysis for Cortisol Reactivity  $\mu\text{g/dL}$  with Neuroticism

---

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Neuroticism	.007	.003	.284	2.443	.017

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## APPENDIX L

Table 12.

Summary of Stepwise Regression Analysis for Self-Reports of Stress  $\mu\text{g/dL}$ 

---

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Neuroticism	-.069	.034	-.239	-2.028	.046

---

## APPENDIX M

Table 13.

Means for Female Participants

---

Judge	Self-Reports of Stress	Cortisol
All Female	6.00	.008
Mixed Gender	8.04	.085
Total	7.04	.047

---

## APPENDIX N

Table 14.

Means for Male Participants

---

Judge	Self-Reports of Stress	Cortisol
All Female	6.38	.149
Mixed Gender	6.33	.262
Total	6.36	.203

---

## APPENDIX O

Table 15.

Means for Post STAI Stress Scores with PANAS Pre and Post

Post STAI Stress Scores	Pre PANAS Positive	Pre PANAS Negative	Post PANAS Positive	Post PANAS Negative
3.00	30.33	10.33	31.67	17.67
N	3	3	3	3
4.00	39.63	14.25	33.88	17.88
N	8	8	8	8
5.00	32.13	15.47	27.33	23.93
N	15	15	15	15
6.00	35.27	14.45	30.00	26.27
N	11	11	11	11
7.00	25.00	14.50	21.50	28.00
N	2	2	2	2
8.00	33.69	18.77	23.54	30.92
N	13	13	13	13
9.00	33.44	15.33	23.44	34.22
N	9	9	9	9
10.00	32.75	19.50	21.00	36.50
N	4	4	4	4
11.00	35.80	18.20	28.40	34.20
N	5	5	5	5

## APPENDIX P

**Angelo State University  
Institutional Review Board (IRB)****Consent to Participate in an IRB-Approved Research Event**

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Project Title: **Leadership Skills and Academic Tasks**

Investigator Name/Department: **Whitney Russell Psychology, Sociology and Social Work**

Investigator Email: **wrussell1@angelo.edu**

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You are being asked to participate in a research event conducted with the approval of the Angelo State University Institutional Review Board (and if applicable, other relevant IRB committees). In order to participate, you are required to give your consent by reading and signing this document.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask any questions you have at any time before the project begins. A basic explanation of the project is written below. Please read and, should you decide to participate, sign this form in the presence of the person who explained the project to you. Upon request, you will be given an unsigned copy of this form for your records.

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time without penalty. I understand also that it is not possible to identify all potential risks in an experimental procedure, and I believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

**1. Nature and Purpose of the Project**

The purpose of the study is to examine the impact of leadership skills on academic tasks. If the hypothesis is true: if leaders in an organization were trained in a specific function of Transformational Leadership then they could handle stressful jobs better than someone who is not trained in those traits.

**2. Explanation of Procedures.**

The procedures of the study involve participants being asked to do a public speaking and counting exercise. It will take approximately 10 minutes for the public speaking exercise (5 minutes to prep, 5 minutes to speak) and 5 minutes of the counting exercise. Saliva samples will be collected before and after the experiment. Questionnaires dealing with demographics and current stress level will be given before the tasks. We must wait 10 minutes after the stressor to take the second cortisol sample. The study will last approximately 45 minutes and all participants will receive a 1 credit for participation.

**3. Discomfort and Risks.**

The risks of the study are minimal, however please read the risks section carefully. Some risks include but are not limited to: minor increase in heartrate, sweating, and social discomfort.

- Please do not participate in this experiment if you have been diagnosed with a panic disorder, a seizure disorder, or major depression due to the effect on cortisol release and stress.
- Please notify the instructor if you have smoked cigarettes, consumed caffeine, or have eaten in the past two hours.
- Please notify the instructor if you have any questions regarding the risks or do not understand any part of the risks. Understand that you are free to withdraw from the experiment at any time if you feel uncomfortable with any part of the experimental method.

#### **4. Benefits.**

The benefits of the study include an opportunity to experience and learn more about the research process and your participation contributes to the body of scientific literature, specifically on the process of cognition and stress.

#### **5. Confidentiality.**

Please understand that all of the research and evaluation materials will be confidentially maintained. The means used to maintain confidentiality are:

- Your name and data will be given a code number for research identification, to ensure that your name will be kept confidential and separate from the data.
- Data, along with consent and debriefing forms, will be kept in a locked file cabinet and/or in an electronic file with a protected password.
- Only the investigator will have access to your identification data.

The dated approval stamp on this consent form indicates that this project has been reviewed and approved by the Angelo State University Institutional Review Board (IRB) for the protection of human subjects in research and research related activities.

Any questions regarding the conduct of the project, questions pertaining to your rights as a research subject, or research-related injury should be brought to the attention of the IRB administrator, Dr. Tay Hack TEL: (325) 942-2068, ext. 6121.

Any question about the conduct of this research project should be brought to the attention of the investigator as listed on this form.

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Participant Signature

Date

## APPENDIX Q

## Demographics Questionnaire

Smoking: Nicotine dependent subjects should have a cigarette two hours prior.

Caffeine: No caffeinated beverages or energy drinks should be consumed within two hours.

Diet: The subject should not eat within three hours.

1. How old are you?  
\_\_\_\_\_
2. What year are you? (Circle one)  
Freshman Sophomore Junior Senior Masters
3. Major  
\_\_\_\_\_
4. Minor  
\_\_\_\_\_
5. Sex (Circle one)  
Male Female Other\_\_\_\_\_
6. What is your total household income? (Circle One)
 

Less than \$10,000	\$60,000 to \$69,999
\$10,000 to \$19,999	\$70,000 to \$79,999
\$20,000 to \$29,999	\$80,000 to \$89,999
\$30,000 to \$39,999	\$90,000 to \$99,999
\$40,000 to \$49,999	\$100,000 to \$149,999
\$50,000 to \$59,999	\$150,000 or more
7. How do you describe yourself? (Please circle the one option that best describes you)
 

American Indian or Alaska Native	Black or African American
Hawaiian or Other Pacific Islander	Hispanic or Latino
Asian or Asian American	Non-Hispanic
8. Females Only: Do you currently take birth control? (Circle one)  
Yes/No
9. Females Only: If not, when was your last menstrual cycle?  
\_\_\_\_\_
10. Do you smoke or use tobacco products? (Circle one)  
Yes/No



11. Do you have a diagnosed mental illness? (Circle one)

Yes/No

12. If so, please state what that is; Particularly major depression, panic disorder, or seizures

\_\_\_\_\_

13. Are you on an athletic team or were you on an athletic team in high school? (Circle one)

Yes/No

14. Are you in the Military? (Circle one)

Yes/No

15. On Average, do you see yourself as a good leader? (Circle one)

*Very Strongly Disagree* 1 2 3 4 5 *Very Strongly Agree*

16. Have you held a leadership position before? (Circle one)

Yes/No

17. If yes, how many?

\_\_\_\_\_

18. Do you have a job or have you ever been interviewed for a job? (Circle one)

Yes/No

19. Do you hold any leadership positions at a place of employment? (Circle one)

Yes/No

20. If yes, do you manage people? (Circle one)

Yes/No

21. What is your birth order? (Circle one)

- a. First born
- b. Middle Child
- c. Youngest

22. What is your Martial Status? (Circle one)

- a. Married
- b. Single
- c. Divorced

## APPENDIX R

## Leadership Questionnaire

The following statements concern how you feel about your own leadership skills and behavior. Please indicate your degree of agreement or disagreement with each of the statements using the response scale provided.

1 = Very Strongly Disagree to 7 = Very Strongly Agree

	<b>Very Strongly Disagree</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>Very Strongly Agree</b>
1. My followers would agree that I excel at getting the best out of people.							
2. My followers would say that I bring positive energy to work.							
3. Others seem to easily follow my lead.							
4. I have found that motivating people to do their best is the primary key to success.							
5. My followers would say that I have an extremely high level of motivation							
6. I am quite effective in boosting my followers' self-confidence.							
7. My followers have told me that my enthusiasm is infectious.							
8. Inspiring others has always come easily to me.							
9. I work hard to provide my followers with an inspirational vision for our group.							
10. My followers would report that I have cheered them up when they were in a bad mood.							
11. Other people look to me for direction.							
12. My followers marvel at my energy.							
13. It is extremely important to me that my followers are creative.							
14. Things would be a lot easier if people just do what I say without a lot of complaining.							
	<b>Very Strongly</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>Very Strongly</b>

	<b>Disagree</b>						<b>Agree</b>
15. When a follower has an idea that differs from the rest of the group, it's best to just ignore it and move on.							
16. Things would be a lot easier if people just do what I say without a lot of thinking.							
17. The only way for our team to be successful is if everyone contributes their own thinking and creativity.							
18. My followers would agree that I challenge them to think creatively when solving problems.							
19. All my followers would say that I challenge them intellectually.							
20. Although I hate to admit it, I wish my followers would just do what I tell them to do.							
21. My followers would say that I encourage innovation.							
22. My followers would say that I am a good mentor.							
23. My followers would tell you that I check in with them on almost a daily basis to find out how they are feeling and thinking.							
24. Each of my followers would say that I know them personally.							
25. One of my primary goals as a leader is to support the continuous learning of my followers.							
26. My followers would tell you that I care about their needs and concerns.							
27. My followers would say that I am very attentive to their individual needs and concerns.							
28. I spend a great deal of time getting to know my followers individually.							
	<b>Very Strongly Disagree</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>Very Strongly Agree</b>

29. My followers have often told me that they appreciate my attention to their feelings and concerns.							
30. My followers would say that I create a supportive environment.							
31. My followers would be surprised if I did something inconsistent with our shared mission and values.							
32. Above all else, leaders must serve as a positive role model for those they lead.							
33. My followers would say that they know what I stand for.							
34. My followers look to me as a role model for their own leadership.							
35. I would never require a follower to do something that I wouldn't do myself.							
36. My followers would never say that they are ashamed of something I have done as a leader.							
37. In some cases, I would not want my followers to see how I achieved results.							
38. Under many circumstances, it is okay for a leader to say one thing and do another.							
39. My followers would report that they respect and admire my leadership style.							
40. I try to set a positive example by always working hard.							

## APPENDIX S

Please make sure you have answered *all* the questions.

## Self-evaluation Questionnaire

A number of statements which people have used to describe themselves are given below. 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.

	Not at all	Somewhat	Moderately	Very much
I feel calm	1	2	3	4
I am tense	1	2	3	4
I feel upset	1	2	3	4
I am relaxed	1	2	3	4
I feel content	1	2	3	4
I am worried	1	2	3	4

Please make sure you have answered *all* the questions.

## APPENDIX T

## Personality

Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex and you are, and roughly the same age. Use the scale below to respond to each item.

	Very Inaccurate	Slightly Inaccurate	Neither	Slightly Accurate	Very Accurate
1. Am the life of the party	1	2	3	4	5
2. Feel little concern for others	1	2	3	4	5
3. Am always prepared	1	2	3	4	5
4. Get stressed out easily	1	2	3	4	5
5. Have a rich vocabulary	1	2	3	4	5
6. Don't talk a lot	1	2	3	4	5
7. Am interested in people	1	2	3	4	5
8. Leave my belongings around	1	2	3	4	5
9. Am relaxed most of the time	1	2	3	4	5
10. Have difficulty understanding abstract ideas	1	2	3	4	5
11. Feel comfortable around people	1	2	3	4	5
12. Insult people	1	2	3	4	5
13. Pay attention to details	1	2	3	4	5
14. Worry about things	1	2	3	4	5
15. Have a vivid imagination	1	2	3	4	5
16. Keep in the background	1	2	3	4	5
17. Sympathize with others' feelings	1	2	3	4	5
18. Make a mess of things	1	2	3	4	5
19. Seldom feel blue	1	2	3	4	5
20. Am not interested in abstract ideas	1	2	3	4	5
21. Start conversations	1	2	3	4	5
22. Am not interested in other people's problems	1	2	3	4	5
23. Get chores done right away	1	2	3	4	5

24. Am easily disturbed	1	2	3	4	5
25. Have excellent ideas	1	2	3	4	5
26. Have little to say	1	2	3	4	5
27. Have a soft heart	1	2	3	4	5
28. Often forget to put things back in their place	1	2	3	4	5
29. Get upset easily	1	2	3	4	5
30. Do not have a good imagination	1	2	3	4	5
31. Talk to a lot of different people at parties	1	2	3	4	5
32. Am not really interested in others	1	2	3	4	5
33. Like order	1	2	3	4	5
34. Change my mood a lot	1	2	3	4	5
35. Am quick to understand things	1	2	3	4	5
36. Don't like to draw attention to myself	1	2	3	4	5
37. Take time out for others	1	2	3	4	5
38. Shirk my duties	1	2	3	4	5
39. Have frequent mood swings	1	2	3	4	5
40. Use difficult words	1	2	3	4	5
41. Don't mind being the center of attention	1	2	3	4	5
42. Feel other's emotions	1	2	3	4	5
43. Follow a schedule	1	2	3	4	5
44. Get irritated easily	1	2	3	4	5
45. Spend time reflecting on things	1	2	3	4	5
46. Am quiet around strangers	1	2	3	4	5
47. Make people feel at ease	1	2	3	4	5
48. Am exacting in my work	1	2	3	4	5
49. Often feel blue	1	2	3	4	5
50. Am full of ideas	1	2	3	4	5

## APPENDIX U

## PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer using the scale below. Indicate to what extent you felt this way *right now*.

	Very Slightly or not at all	A Little	Moderately	Quite a bit	Extremely
Enthusiastic	1	2	3	4	5
Active	1	2	3	4	5
Upset	1	2	3	4	5
Anxious	1	2	3	4	5
Strong	1	2	3	4	5
Incompetent	1	2	3	4	5
Hostile	1	2	3	4	5
Tense	1	2	3	4	5
Frustrated	1	2	3	4	5
Inadequate	1	2	3	4	5
Effective	1	2	3	4	5
Irritable	1	2	3	4	5
Interested	1	2	3	4	5
Nervous	1	2	3	4	5
Proud	1	2	3	4	5
Alert	1	2	3	4	5
Excited	1	2	3	4	5
Attentive	1	2	3	4	5
Bored	1	2	3	4	5
Determined	1	2	3	4	5





ANGELO STATE UNIVERSITY

College of Graduate Studies

*Institutional Review Board*

9/27/2016

Dr. Kyle van Ittersum  
Dept. of Psychology, Sociology, & Social Work  
Angelo State University  
San Angelo, TX 76909

Dear Kyle:

Your student, Whitney Russell, submitted an addendum proposal for her previous project approved by the IRB on February 2, 2016, titled, "*Leadership Skills and Emotional Contagion.*" The addendum has been reviewed and APPROVED in accordance with federal regulations 45 CFR 46.

The approved addendum is effective beginning September 27, 2016. Please be aware that the protocol will expire one year from its original approval date, which means that the protocol will end on February 1, 2017. If the study will continue beyond that date, you must submit a request for continuation before the current protocol expires.

The approved addendum is for protocol #BRE-020216. Please include this number in the subject line of in all future communications with the IRB regarding the protocol.

Sincerely,

A handwritten signature in black ink, appearing to read 'THack', is written over a horizontal line.

Teresa Hack, Ph.D.  
Chair, Institutional Review Board