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## Identifying the Effects of Personality Type on Stress

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THE FLORIDA STATE UNIVERSITY  
COLLEGE OF ARTS & SCIENCES

IDENTIFYING THE EFFECTS OF PERSONALITY TYPE ON  
STRESS

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## Abstract

In this study, the influence of personality traits and stress was examined. Fifty-six undergraduate students at the Florida State University Panama City campus participated. In the beginning of the experiment, participants were required to complete the Big Five Personality Test and the State Trait Anxiety Inventory (STAI). Following this, participants were randomly assigned one of two conditions (low stress, high stress). In the low stress condition, participants completed simple subtraction problems, whereas in the high stress condition participants completed complex long-division problems. Calculators and electronic calculating devices were not permitted. After participants completed the math problems they filled out an alternative version of the STAI. It was hypothesized that individuals who scored high on the trait, neuroticism, would produce higher scores of anxiety on the STAI following the experimental manipulation than would participants who scored low or not at all on the trait. It was found that participants high in neuroticism, produced greater trait anxiety scores, regardless of the experimental manipulation, suggesting that even minor stressful events initiate anxiety in individuals high on this trait.

## Identifying the Effects of Personality Type on Stress

Research has shown that personality traits are important determinants of how well an individual responds to stressful events (Costa, 1985). Personality traits are characteristics that describe an individual. While there are a number of tests and inventories to assess personality traits (e.g., Cattell's Sixteen Factor PF, Myers-Briggs Type Indicator, etc.), one of the most efficient and commonly used, is the Five-Factor model, called the Big Five (Costa, 1985). The Big Five uses five factors to assess personality. These factors are: Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. The Big Five has been used in general populations as well as some psychiatric populations (Ando, Claridge and Clark, 2014).

Individuals who score high on neuroticism, tend to experience greater negative emotions (e.g., fear, sadness, embarrassment, anger, guilt, and disgust) and anxiety than do individuals who score low on this factor (DeLongis, Lee-Baggley, and Preece, 2005). Traits associated with neuroticism include being anxious, moody, irritable, and pessimistic. Moreover, those scoring high on neuroticism are at risk for developing depression and anxiety disorders (Hirschfeld et al., 1989). It has also been reported that neuroticism is moderately heritable (Birley et al., 2006), indicating that for some individuals, the traits are genetic and not the result of environmental factors (learning histories, etc.). Because individuals high in neuroticism are prone to anxiety and negative affect, they are poorer at coping with stressful events than are people who score low on this trait (DeLongis et al., 2005).

Unlike Neuroticism, the factor agreeableness, appears to be associated with better coping strategies to stress (DeLongis et al., 2005). High scores in agreeableness are associated with stoic and compliant attitudes to stressful situations and it has been reported that individuals high

on this trait are less likely to use emotion-focused (e.g., self-blame, avoidance, and wishful thinking) coping strategies to stressful stimuli (DeLongis et al., 2005).

Expanding on the research described above, there appears to be a link among personality traits, personality types, and coping strategies to stressful events (DeLongis et al., 2005, Penley & Tomaka, 2001). For over well over six decades it has been shown that certain personality types, such as Type A, are predisposed to negative health outcomes (e.g., heart disease, stroke, and cancer) associated with stress (Grant & Langanfox, 2003). Individuals with Type A tend to be intense, irritable, highly competitive, socially isolated from others, ambitious, achievement-oriented and impatient. Individuals with Type A personalities share a number of common traits found in those scoring high in neuroticism (e.g., anxious, intense, etc.), suggesting that there is overlap between neuroticism as a personality dimension and Type A personality. For instance, it has been reported that neuroticism is positively associated with emotion-focused strategies of defensive coping and that this creates social isolation from others as the person draws into themselves (Penley & Tomaka, 2001). If the social isolation observed in Type A personality, is the result of the same emotion-focused strategies used by people scoring high on neuroticism, then it suggests that neuroticism may be the trait dimension underlying the patterns of Type A personalities (Penley & Tomaka, 2001). This line of inquiry merits further investigation.

Currently, research into the influence of stress and personality focuses on personality traits, such as neuroticism. People scoring high on neuroticism, as classified by the Big Five and other personality trait measures (E.g., Eysenck Personality Questionnaire), are prone to anxiety-related stimuli and tend to experience more negative effects associated with emotional reactions to stressful events than do individuals scoring low on this trait (DeLongis, et al., 2005, Penley &

Tomaka, 2001). Based on these findings it is expected that individuals with high scores on neuroticism will experience more trait anxiety.

This study investigated the influence of stress and neuroticism on measures of trait anxiety. Personality traits will be measured using the Big Five Personality Questionnaire, while state and trait anxiety will be measured by the State-Trait Anxiety Inventory (STAI). Participants' personality traits and baseline level of anxiety were recorded in the beginning of the experiment. Following completion of these tests, participants will be exposed to either a low stress condition or a high stress condition. In the low stress condition, participants will complete basic subtraction problems and in the high stress condition participants will complete challenging long division problems. Following this, participants' trait anxiety levels will be reexamined. The definition of stress we are using for the purpose of this experiment is an organism's measured response to a stressor such as an environmental condition or a stimulus. Stress has been known to have an impact on an organism's mental and physical well-being which is what we hope to demonstrate in this study (Beilock, S. L. & DeCaro, M. S. 2007).

We hypothesize that individuals who score high in neuroticism as measured by the Big Five will be more susceptible to the high stress condition (complex math problems) and will show greater trait anxiety scores following the manipulation than those individuals who do not demonstrate the neuroticism trait. It is also hypothesized that the high stress condition will elicit greater state anxiety in all participants.

## **Methods**

### **Participants**

Fifty-six undergraduates (46 females, 10 males) with a mean age of 32.8 (SD=10) participated in this experiment. Participants were volunteers recruited from psychology classes

at the Panama City Campus of Florida State University. Participants were treated in accordance with APA guidelines.

### **Procedure**

This experiment was conducted in a classroom setting. In the beginning of the experiment, each participant completed the Big Five Personality test and the State Trait Anxiety Inventory (STAI). Following their completion of this phase of the experiment, participants were randomly assigned to either the low stress condition or the high stress condition. In the low stress condition, participants were required to complete 10 subtraction problems, whereas in the high stress condition participants were required to complete 10 long-division problems. Math problems of varying complexity were used in this study to induce low and high stress based on previous research (Beilock & DeCaro, 2007). There was no pre selection of based math capabilities and the participants were not asked about their knowledge of math. The low and high stress conditions were randomly assigned to each participant. Participants were not permitted to use calculators, phones, or any other electronic devices on the math problems. Once participants completed their math problems, they were given an alternative form of the STAI to complete.

### **Materials**

The materials used in this study were the Big Five Personality test and the State Trait Anxiety Inventory (STAI). The Big Five consists of 44 items that assess personality traits using a Likert scale (1=strongly agree, 2=disagree, 3=neither disagree nor agree, 4=agree, 5=strongly agree). Each question examined a given personality trait. The higher the participant's scores to the question, the more likely the trait was present. The Big Five was used here to assess personality characteristics on five dimensions (neuroticism, openness, agreeableness, conscientiousness, and extraversion).

The STAI was used to assess anxiety levels. The STAI consists of 40 items, twenty of which determine state anxiety (anxiety associated with environmental factors) and twenty of which determine trait anxiety (anxiety that appears to be a trait). The two measures of state and trait anxiety are divided into the absence/presence of anxiety, so that the data was spilt into four categories: state-absent, state-present, trait-absent, and trait-present between 20 and 80 points on each of these variables. The higher the number the greater the anxiety for state-present and trait-present questions, but for state-absent and trait-absent questions the opposite is true. State-absent means that state anxiety is absent. State-present means that state anxiety is present. Trait-absent means that trait anxiety is absent. Trait-present means that trait anxiety is present.

### **Variables**

The independent variable in this study was stress (low, high) that was induced by simple math subtraction problems or difficult long-division math problems. Though neuroticism (non-neurotic, neurotic) is a subject variable, it was used as a between-subjects variable in this study. State and trait anxiety scores on the STAI were treated as dependent variables.

### **Results**

To examine whether neuroticism and stress influenced trait anxiety, a 2 X 2 (neuroticism by stress) ANOVA was performed on the variable, post trait-absent. A significant main effect for neuroticism was found,  $F(1, 51)=12.16, p<.001$ , which revealed that participants who scored high on neuroticism ( $M=26.43, SD=2.05$ ) produced greater trait anxiety scores following the experimental manipulation than did participants ( $M=18.58, SD=.90$ ) who did not demonstrate this trait (see Figure 1). No significant differences for the main effect, stress  $F(1, 51)=2.48, p>.12$ , or the stress by neuroticism interaction,  $F(1, 51)=1.55, p>.21$ , were observed.

A 2 X 2 (neuroticism by stress) ANOVA was also performed on the variable, post trait-present. It will be seen in Figure 2, that a significant main effect for stress was found,  $F(1,51)=4.70$ ,  $p<.03$ , which indicated that participants produced greater anxiety scores in the high stress condition. Means for the high and low stress anxiety scores are as follows: 27.70 (SD=1.54) and 22.75 (SD=1.68), respectfully. A significant main effect for neuroticism was also revealed,  $F(1,51)=32.60$ ,  $p<.001$  (see Figure 3). Like the analysis above, individuals who scored high on neuroticism (M=31.75, SD=2.09) produced greater trait anxiety present scores than did those who did not score on this trait (M=18.70, SD=.92). The stress by neuroticism interaction was not significant.

Dependent t-tests were conducted on the following variables: pre state absent, pre trait absent, post state absent, post trait absent. There was no difference,  $t(5) = -2.2$ ,  $p>.08$ , close but not significant, between pre trait present and post trait present among neurotics in the high stress condition but no significant effect. A significant t-test on the variables, pre state absent and post state absent, was observed,  $t(56) = -2.12$ ,  $p<.03$ . This finding seems to indicate that state anxiety increased following the experimental manipulation as was hypothesized.

### **Discussion**

The results of the study show evidence that neurotic personalities have more stress and anxiety in general, but especially under high stress conditions. The competitive nature of Type A personalities that share similar traits with neurotics react in the same manner as neurotics with stress and anxiety. People with Type A personalities may or may not possess neuroticism but it is often listed as a trait associated with these types of personalities which suggest that they may be similar. This is why we did not measure for Type A personality and instead focused directly on neuroticism since this particular trait has been shown to be positively correlated with anxiety

(Penley & Tomaka, 2001). However, state anxiety can be produced through stressful events in neurotics and non-neurotics (for example, during the high stress condition in which long division math problems were presented).

We found some limitations of this study such as small sample size for neurotics compared to that of non-neurotics. This may have caused the scores from t-tests performed to show little effects, though a significant stress main effect was observed. This does suggest there was a correlation between neuroticism and trait anxiety.

Another factor under consideration was the anxiety caused by students in the experimental group who were under the high stress condition. Participants in the high stress condition noticed that students in the low stress condition finished early. This led the experimental group to believe they were taking longer than their peers to finish the math problems presented to them. Neither group were told that the other group had received a different set of problems the students participating in the study thought all the problems were the same. None of the participants were aware of the actual intent for the study. Many students believed that the experiment was designed to test the accuracy of their math skills or perhaps to identify what personality types possessed better math skills. It is possible the different math abilities may have influenced participants' reactions to the stressful conditions.

In the future I believe the research could be improved by having a larger sample size, including participants from several different majors, pre-selecting participants with neuroticism, and perhaps using more challenging math problems based on the participants knowledge. This would be easier if the study did select participants from particular majors which usually has some indication of how mathmatically inclined the students are, thus allowing the experimenter

to adjust the difficulty of the problems. If this condition had been used during this study it might have proven the results to be more generalized.

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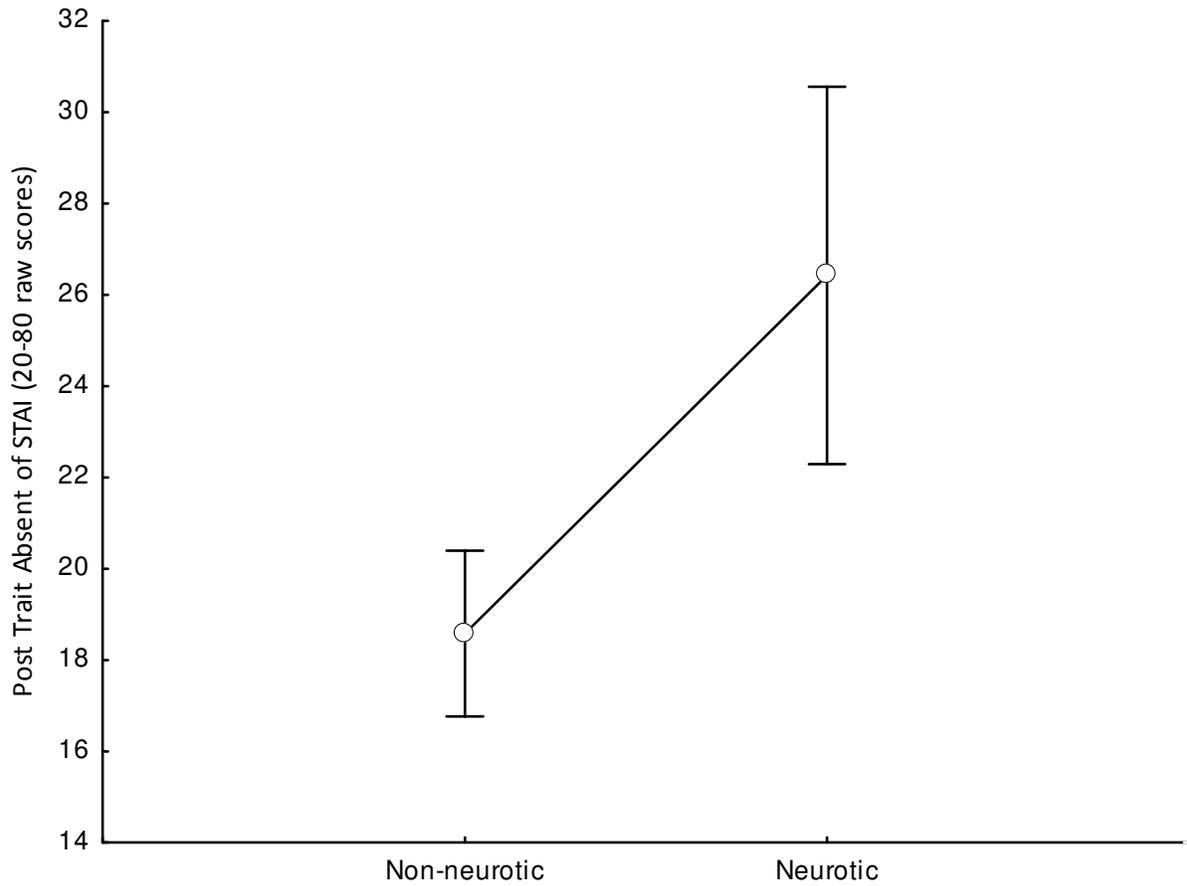
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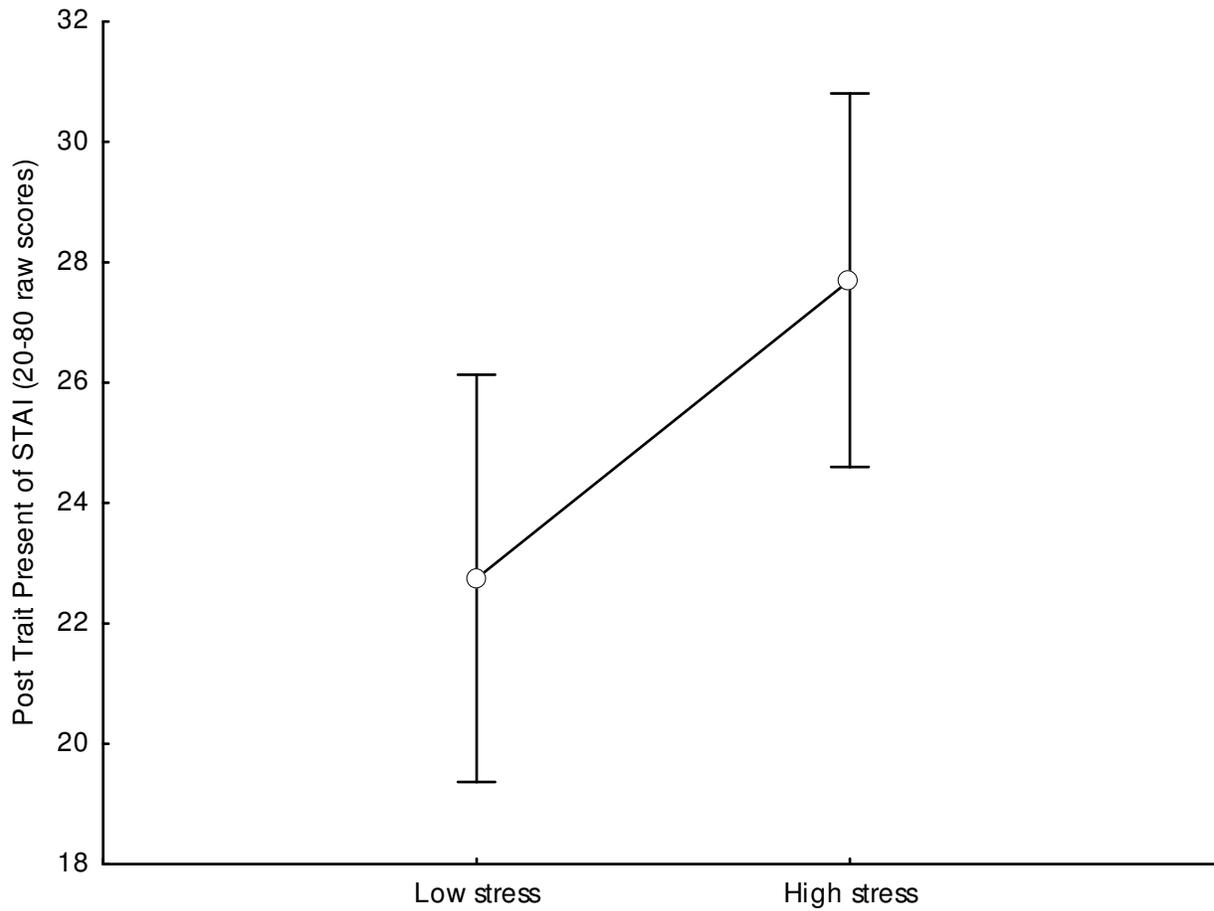
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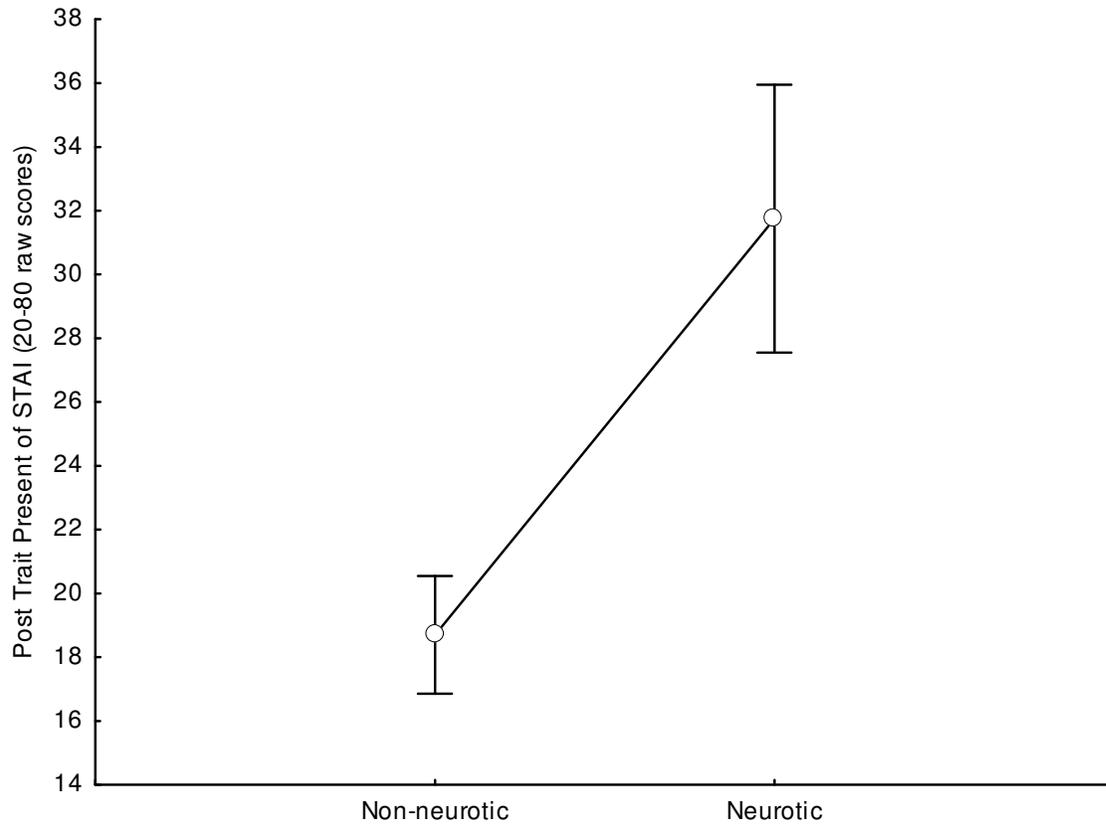
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*Figure 1.* A significant main effect for neuroticism was found which revealed that participants who scored high on neuroticism produced greater trait anxiety scores following the experimental manipulation than non-neurotics.



*Figure 2.* A significant main effect for stress was found which indicated that participants produced greater anxiety scores in the high stress condition.



*Figure 3.* A significant main effect for neuroticism was also revealed and individuals who scored high for neuroticism scored higher for trait anxiety present after the manipulation than non-neurotics.