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Personality and Performance in Stressful Situations

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Winter 2007

Abstract

This study examines the relationship between the Five Factor Model of personality traits and performance in stressful situations. A working memory task was then administered to record the participants' performance in two conditions, one with and one without time pressure. The level of state anxiety was then assessed after both conditions. Participants' (N=31) results on the working memory tasks were compared with their answers to a Five Factor Model inventory and only neuroticism was found to be significantly correlated with a the difference in scores for the math problems across each task, $r(31) = -.384$, $p = .033$. This negative correlation supports Hypothesis 2, in that the more neurotic a person was the less accurate their performance was during the math problems. A three-way interaction between speed, neuroticism group, and state anxiety scores on the fast condition was also found to be significant, $F(1,27) = 11.71$, $p = .002$. The Yerkes-Dodson law provides one simple explanation for the range of results of this study and further insinuates a more complex relationship between personality and performance in stressful situations than previously considered.

Personality Factors and Predicting Performance in Stressful Situations

Organizations face a growing problem of managing stress during daily performance (Williams & Cooper, 1998). Stress in the workplace can arise as a feeling or reaction individuals have when faced with a situation that demands performance from them, especially performance that may be beyond their capabilities (Sarason & Sarason, 2005). The insistent pressure to work at optimum performance levels can exacerbate problems like job dissatisfaction, reductions in efficiency, employee turnover, and illness (Canadian Mental Health Association, 2006). Unfavorable problems in the workplace such as deteriorations in performance effectiveness, absenteeism, illness, alcoholism, bad decisions, indifference, apathy, and lack of motivation or creativity can be attributed to an over stressed work environment (Canadian Mental Health Association, 2006; Sarason, & Sarason, 2005). Employees faced with the daily pressure to perform can get trapped in a downward spiral of requiring increasing effort to meet higher and higher expectations with no increase in job satisfaction (Canadian Mental Health Association, 2006).

As can be expected, stress has been shown to negatively affect a person's performance in many different situations (Williams & Cooper, 1998). Whether it is a student taking an important test, a driver dealing with difficult traffic, or an office worker struggling to meet a deadline, the stress felt from these situations can have a negative impact on performance (Zeidner, 1998; Matthews & Desmond, 2002; Matthews & Falconer, 2002). Two areas of cognitive functioning which are relevant to everyday performance are episodic memory and working memory. Episodic memory includes the recollection of information about events such as time, place, and associated emotions

(Tulving, 1972). Working memory refers to the structures and processes the brain uses to temporarily store and manipulate information (Engle & Kane, 2004). It is seen as a workbench to manipulate and transform old and new information (Solso, MacLin, & MacLin, 2005). The experience of stress has been shown to impair performance on episodic memory (Jelicic, Geraerts, Merckelbach, & Guerrieri, 2004) and working memory (Klein & Boals, 2001) across young and older adults (Sliwinski, Smyth, Hofer, & Stawski, in press; Wolf, Kudielka, Hellhammer, Hellhammer, & Kirschbaum, 1998). Working memory can be utilized in the workplace environment when someone is trying to process or manipulate information, while at the same time remembering some other form of information. If stress can have a negative effect on the episodic and working memory, then workers would be slower and less efficient in situations which require remembering events and multi-tasking.

Furthermore, stress has been thought to impair cognitive functioning in these memory areas by reducing the amount of attention one can allocate to processing the information (Kahneman, 1973). Thus, the effects of stress on cognition and performance can be attributed to resource competition, such that stress acts as a cognitive load which divides attention in the brain between the demands of the task and coping with the demands of the environment (Stawski, Sliwinski, & Smyth, 2006).

Personality also adds another important factor to the relationship of performance and stress. Personality can be defined as the pattern of collective character, behavioral, temperamental, emotional, and mental traits of a person (McAdams, 2001). The variation of traits represented in people's personalities can allow for considerably different

responses to stress (Sarason & Sarason, 2005). Some traits are related to how we can understand our own thoughts and feelings. It is proposed that awareness of one's own feelings can help more effectively cope with stress (Sarason & Sarason, 2005). This makes it reasonable to inquire that certain personality traits can allow the person to better observe their own thoughts and feelings in challenging situations which can allow them to more effectively perform under stress.

One tool that has been helpful to organizations to better understand the relationship between stress and performance is the Five Factor Model. The Five Factor Model of personality is the classification of a person's personality into five broad factors of personality traits found through inductive statistical analysis of the traits that were most frequently observed in the population (Srivastava, 2006). Practically, the Five Factor Model has captured commonalities among existing personality descriptions at a broad level of abstraction, and presents an integrative descriptive model from which widespread research on personality can be generated (John & Srivastava, 1999). It has enabled researchers to empirically examine the relationship between five generally accepted personality traits and performance in an organized and consistent method (Witt, Burke, Barrick, & Mount, 2002). Additionally, the language of the model is not biased in favor of any existing theoretical conceptions, which allows for a more favorable reception of the Five Factor Model across theoretical fields (John & Srivastava, 1999).

The Five Factor Model traits are openness to experience, agreeableness, extraversion, neuroticism, and conscientiousness. Each trait has its own characteristics

and affects performance differently. Table 1 provides a short description of the characteristics of each trait.

Table 1.

Description of Five Factor Model Traits

Five Factor Model Trait	Description
Openness to Experience	Seen as having wide interests, being imaginative, and insightful
Agreeableness	Seen as being sympathetic, affectionate, and kind
Extraversion	Seen as projecting energy, surgency, assertiveness, and talkativeness
Neuroticism	Tendency to experience negative emotions such as anger, anxiety, depression, or vulnerability
Conscientiousness	Tendency to show self-discipline, act dutifully, aim for achievement, and be organized

Note. From Srivastava, S. (2006). *Measuring the Big Five Personality Factors*. Retrieved October 11, 2006, from http://www.uoregon.edu/~sanjay/bigfive.html.

The most significant strength of the Five Factor Model is its useful organization into a generally accepted taxonomy for analyzing relationships between personality traits and performance (Srivastava, 2006). Another strength of the Five Factor model is its wide applicability. The magnitude of the Five Factor Model's acceptance has been shown as it has been applied to wide areas such as industrial psychology, health psychology (Smith & Williams, 1992), aging (Costa & McCrae, 1992), behavioral genetics (John & Srivastava, 1999) and psychopathology (Trull & Sher, 1994; Widiger & Trull, 1992). In validation of its applicability, the Five Factor Model has been replicated across different theoretical frameworks using different assessment approaches, in different cultures, languages, and using ratings from different sources (Barrick, Mount, & Judge, 2001; Digman & Shmelyov, 1996). Previous research has provided abundant evidence to support the use of the Five Factor Model over other theories in personality research, and it could possibly be used as a valuable instrument to analyze performance in stressful situations.

According to Eysenck (1991), the validity of the Five Factor Model traits should used as an instrument to investigate socially relevant criteria including academic aptitude and work performance to enhance our knowledge in these areas. With the introduction of the Five Factor Model, researchers could begin to explore relationships between five basic fixed traits and a range of performance areas. The vast majority of research in examining the relationship between the Five Factor Model traits and performance has been done using the traits to predict general areas of performance such as in sales,

management, teamwork, training proficiency, the military, and the police (Barrick et al., 2001). This analysis has proven very fruitful as many significant relationships between the Five Factor Model and performance criteria have been found (Barrick & Mount, 1991; Barrick et al., 2001; Mount, Barrick, & Stewart, 1998).

In a meta-analysis of 15 studies about the Five Factor Model and performance prediction, Barrick, Mount, and Judge (2001) examined the predictability of each Five Factor Model trait with general levels of performance. For example, extraversion was shown to be related to teamwork, training performance, and managerial as well as police officer performance, neuroticism was found to be predictive of overall work performance across jobs and was related to performance in certain occupations, and conscientiousness was shown to predict performance across all jobs along with teamwork and training (Barrick et al., 2001). Individual differences in reactions to stress and performance have consistently correlated with individual personality traits and the Five Factor Model is a useful model for individual assessment of this relationship because of its current importance and use in the applied fields of psychology (Barrick et al., 2001).

Each independently conducted meta-analyses as reviewed by Barrick, Mount, and Judge (2001) have shown consistent relationships between the Five Factor Model traits and more general levels performance, but they also suggest that more research should be done in order to study the relationship between personality and more specific levels of performance such as performance in stressful situations. Rather than looking at an individual's performance in a general area of measurement such as sales or management, research can be done to look at more specific levels of performance. This can be

accomplished by exploring ways in which an individual's working memory can perform under stress, which could be a specific problem in certain sales conditions. For example, during sales conversations, the salesman needs to store what the client's needs are, while trying to process strategies in which they can get their client to buy the goods or services. By looking further into performance in stressful situations, the results could possibly enhance our understanding of personality and performance.

The idea of the Five Factor Model has enjoyed widespread support in the personality field today in that out of the thousands of conceivable personality traits, these can be condensed down to a set of five manageable dimensions (McAdams, 2001). Furthermore, studies of job performance have also found the Five Factor Model traits to relate to important performance outcomes in the workplace (Barrick & Mount, 1991; Mount, Barrick, & Stewart, 1998). The Five Factor Model's ability to draw common abstractions in personality, its widespread acceptance, and its ability to predict performance outcomes heralds it as a useful model for individual assessment of personality and performance.

There has been a resurgence in interest in the area of personality and performance prediction recently as meta-analytic evidence has demonstrated that certain personality traits are consistently predictive of general areas of performance, and the most widely applied method in this area is the use of the Five Factor Model of personality traits (Barrick & Mount, 1991; Barrick, et al., 2001; Hough, Eaton, Dunnette, Kamp, & McCloy, 1990). Examining which personality traits perform better during stressful situations can have a positive impact in the workforce as well as personnel selection. It is

important to be able to predict performance in general areas such as managing, training, and sales positions, but looking at more specific levels of performance such as performance under stress is important to enhance our overall understanding of the relationship between stress, personality, and performance.

Aims and Hypothesis

The aim of this study is to examine the relationship between the Five Factor Model personality traits and a more specific level of performance. The specific level performance that this study will examine is performance under stressful situations. Two traits that have consistently been found to bring about individual differences in people's performance levels are neuroticism and conscientiousness.

Sarason and Sarason (2005) assert that people with the ability to remain composed and effectively control and act on impulse are better able to cope with stress. Also, people who can observe and adeptly control their own thoughts, feelings, and behaviors engage in more constructive problem solving (Sarason & Sarason, 2005) Conscientiousness involves the way people competently control, regulate, and direct our own impulses (Johnson, 2006). Workers high in conscientiousness are inclined to be diligent, exacting, disciplined, purposeful, and methodical (Witt et al., 2002). People scoring high in conscientiousness should be able to more effectively perform under stressful situations because of their capability to more thoroughly and purposefully direct their impulses and overall behavior.

People scoring high in neuroticism are often negatively affected because of their vulnerability to stress and their tendency to experience negative feelings for unusually

long periods of time (Johnson, 2006). People scoring high in neuroticism are more likely than other personality types to experience anxiety, anger, or depression, and it is these problems with emotional regulation that inhibit the ability of that person to make decisions, think clearly, and effectively cope with stress (Johnson, 2006; Srivastava, S., 2006). A person's vulnerability to stress decreases their ability to effectively carry out tasks (Sarason & Sarason, 2005).

Hypothesis 1 As the participants' level of conscientiousness increases, their performance under stress will increase.

Hypothesis 2 As the participants' level of neuroticism increases, their performance under stress will decrease.

Method

Participants

The participants were 35 students from a small Midwestern college. The age range was 18 to 22. There were 14 males and 17 females. The race of the participants consisted of 27 white, 2 Asian, and 2 Turkish participants. Four subjects had to be thrown out because their data was not submitted at the end of the computerized task discussed below.

Measures

The Five Factor Model personality traits were assessed using the 44-item version of the Big Five Inventory (BFI V44; John, Donahue, & Kentle, 1991). This commonly used inventory was originally composed to more efficiently assess the five personality traits by dismissing the more intricate measurements of the various facets associated with each trait (Benet-Martinez & John, 1998). BFI items consist of short phrases that are representative of each trait. In this study, participants chose how much they agree or disagree with each statement in how it applies to them. In an article by John and Srivastava (1999), the mean reliability of the Five Factor Model traits with the BFI was found to be strongly positive (.83). Previous research has presented adequate evidence for the validity and reliability of the BFI V44 questionnaire (Benet-Martinez et al., 1998; Okun & Finch, 1998). Cronbach's alpha values based on the current sample for the traits were 0.8 for extraversion, 0.6 for agreeableness, 0.75 for conscientiousness, 0.79 for neuroticism, and 0.82 for openness to experience.

Spielberger's State Anxiety Inventory was used to assess the participant's state anxiety after the first and second task. This inventory consists of 20 short statements which ask how a person feels at the present time, and reflects situational factors that may influence anxiety levels. Participants indicated their agreement with each statement on a Likert scale ranging from 1 "not at all" to 4 "very much." Scores range from 20 to 80, with higher scores representing more elevated levels of anxiety. This measure has been found to be both valid and reliable (Spielberger, Gorsuch, & Lushene, 1970). Cronbach's alpha values based on the current sample for the inventory were found to be 0.85 for the slow condition and 0.92 for the fast condition.

Performance Task

A working memory task based on a study done by Matthews et al. (2006) was used to record the participants' performance in a slow condition without time pressure and a fast condition with time pressure. The participant went through a group of problems, each having an arithmetic and word-recall component. The arithmetic component was an equation such as "(14-3) X 2 = 24." The participant was instructed to indicate if this problem was correct or not by clicking on a button that read "Correct" or a button that read "Incorrect." There was also a high frequency concrete noun above each problem (e.g., Horse) in which the participant was instructed to remember. After a set of five problems, the participant had a designated amount of time to recognize the five words presented out of a list of ten words. During the slow condition participants had 7 seconds to view each problem, and 30 seconds to complete the word recognition at the end of each set. During the fast condition participants had 3 seconds to view each problem, and 10 seconds for the word recall. Each task had four sets of five problems (see attached). The study contained two separate task conditions to provide two different levels of difficulty which were hoped to elicit different levels of anxiety from the difference in time pressure. The order of the slow and fast conditions were reversed for half of the participants to control for testing effects. The number of correct recognitions on the arithmetic problems and the number of correct words recalled determined the overall score of the task. The score difference between tasks was then assessed.

Procedure

Participants began by completing the BFI V44 to assess their levels of the Five Factor personality traits. Participants were then given instructions about the task and asked to complete a practice problem set on the computer containing five questions and one word recognition section to familiarize them with the program. They were then instructed to proceed to Task 1, which is four sets of five working memory tasks. After completing Task 1, participants were then asked to fill out the first State Anxiety Inventory to assess their current state of anxiety. After completing this, the participants were instructed to proceed to Task 2. Upon completing Task 2, participants were asked to fill out the second State Anxiety Inventory. The amount of time pressure was different between the two tasks to increase anxiety (Matthews et al., 2006). Participants were then debriefed.

Results

A manipulation check was performed first to verify that the different tasks actually influenced levels of stress, as measured through the Spielberg's State Anxiety Inventory. To test that stress was manipulated as measured by anxiety, a dependent t-test was used to analyze the difference between anxiety levels across each task and this difference was found to be significant, $t(31) = 6.40$, $p < .001$. This indicates that manipulation check worked in that there was significantly more anxiety on the fast task than there was on the slow task. The results in Figure 1 show the direction of the mean scores between tasks in that participants were reporting significantly higher levels of anxiety after the fast task. This indicates that the manipulation check was indeed in the expected direction.

Also, a significant difference was found between differences in scores on the mathematic problems across each task, such that participants scored significantly higher on the math problems in the slow condition than the fast condition, $t(30) = -4.55$, $p < .001$. A significant difference was not found between differences scores in word recognition across each task, $t(30) = -1.41$, $p = .17$. Overall, participants scored relatively accurate in the word recognition problems in both the slow condition (M=0.84) and the fast condition (M=0.77).

Next, the correlations between the Five Factor Model traits and performance scores were examined. Conscientiousness was not found to be significantly correlated with any performance score, thus not supporting Hypothesis 1, so conscientiousness will not be considered further. Only neuroticism was found to be significantly correlated with a the difference in scores for the math problems across each task, $r(31) = -.384$, $p = .033$. This negative correlation supports Hypothesis 2, in that the more neurotic a person was the less accurate their performance was during the math problems.

In order to further analyze the data, a median split was conducted for neuroticism and anxiety scores recorded after the fast condition. The scores on the anxiety and neuroticism measures were split at the midpoint by putting all of the participants reporting scores at the median point and below, and were put into the "Low" group for their respective measure. All of the participants scoring higher than the median number were put into the "High" group for their respective measures.

Both the slow condition ($r = -.79$) and fast condition ($r = .47$) were highly correlated and could have been used for this analysis, but just the fast condition was

analyzed because of the higher levels of anxiety reported after completing it. The data was then analyzed by using a 2 X 2 X 2 mixed design ANOVA test with anxiety (low vs. high) and neuroticism (low vs. high) as between-subject variables and the speed of the condition as a within-subjects variable. The accuracy scores for the math problems and word recognition scores were used as dependent measures. Not significant results were found for the recognition problems so they are not going to be discussed further. Only the scores for the accuracy in the math problem were used for further analysis.

A main effect for speed of the task was found, such that the scores in the fast condition were significantly lower than scores on the slow condition, $F(1,27) = 41.36$, $p < .001$. The interaction between Speed and Neuroticism group was also significant, $F(1,27) = 4.66$, $p = .04$. The interaction between Speed and State anxiety scores on the fast condition was not significant, $F(1,27) = .013$, $p =$ n.s. A three-way interaction between speed, neuroticism group, and state anxiety scores on the fast condition was found to be significant, $F(1,27) = 11.71$, $p = .002$.

The rest of the analysis will focus on the three-way interaction between speed, neuroticism group, and state anxiety scores on the math problems because it more thoroughly represents the complex relationship between neuroticism and performance (See Figure 3). Post hoc comparisons determined by Tukey's HSD were run to find whether the means in the three-way interaction were significantly different from each other. First, the low neuroticism group will be looked at in detail. There was no significant difference between scores for participants with low anxiety across both the fast and slow task. Participants with high anxiety in the slow task performed significantly

better participants with low anxiety. This faction also scored the highest in the low neuroticism group significantly.

Now the high neuroticism group will be looked at in detail. Participants with low anxiety during the slow task performed significantly better than any other participants in the low and high neuroticism groups. These results somewhat contradict Hypothesis 2 in that this group of participants scoring high in neuroticism actually performed best of all. This was surprising in that it conflicts with the negative correlation found between neuroticism and performance. But the participants with low anxiety performed significantly worse in the fast condition than they did in the slow condition and in fact, had the lowest scores overall. This is a very interesting area in the results in that it shows a delicate tipping point of performance with stress such that increasing the speed of the task can cause these participants to go from performing the best overall to performing the worst overall. Furthermore, participants with high anxiety performed significantly better in the slow task than they did in the fast task.

Discussion

The results did not support the initial hypotheses completely. While the direction of the correlation between neuroticism and performance scores were in the appropriate negative direction, the interaction suggests that the simplistic view of Hypothesis 2 is not appropriate. Instead, the results showed a much more complex interaction between personality and performance.

The preliminary analysis showed that the manipulation check for anxiety worked because the participants in the fast conditions reported higher anxiety levels as predicted. However, significant effects were only found for the math problems on performance, which

limits the scope of the available analysis. From these results, the relationship between personality and performance can further be investigated through the participants' scores on the math problems of the working memory tasks.

The pattern of results in the three-way interaction between neuroticism, anxiety, and speed on the math problems show a more complex relationship between personality and performance in stressful situations than previously considered. A significant effect was found on anxiety levels between tasks, showing that increasing the time pressure of a working memory task can cause changes in states of anxiety or arousal. A significant difference between scores on the mathematic problems between the fast and slow condition also provided some insight into where elevated levels of stress can cause declining performance in that the higher stressed participants in the fast condition performed significantly lower than those in the slow condition.

Furthermore, neuroticism was the only trait of the Five Factor Model that proved to have a significant effect on a person's performance. In order to understand the effect of neuroticism on performance, the Yerkes-Dodson law (see Figure 4) will be used. The Yerkes-Dodson law provides an explanation for the relationship between arousal and performance, in that performance increases with cognitive arousal, but only to a certain point (Yerkes & Dodson, 1908). When levels of arousal become too high, performance will decrease. The downward part of the right side of the ∩ shape is caused by negative the effects of arousal, or stress, on cognitive processes like attention, memory, and problem solving (Yerkes & Dodson, 1908). But a person's level of arousal can also be raised to an optimal level for a given task in which they will perform the best. The

upward part of the ∩ shape can be thought of as the energizing effect of arousal. The optimal level of arousal is also task dependent, as can be seen with the difference in scores in the math problems versus the word recognition. This means that different tasks can require different levels of arousal to raise and lower performance levels, thus adding to the complexity of the relationship between personality and performance in stressful situations.

Figure 5 illustrates how the Yerkes-Dodson law might provide an explanation of the interaction between neuroticism, anxiety, and speed on the math problems. It was assumed that anxiety and neuroticism are both able to independently increase arousal. While speed can also increase arousal, the amount of increase may depend upon the person's arousal as a result of their initial anxiety or neuroticism.

Now examine Figure 3 with the results for the interaction of neuroticism, anxiety, and speed and compare it with the relative data points on Figure 5. If the person has low neuroticism and low anxiety, their level of arousal could be considered too low to engage the person enough to perform better. Furthermore, the increase in speed of the task does not change a person's level of arousal between the low anxiety groups, leaving their performance unchanged across the conditions. If the person has low neuroticism but high anxiety, their level of arousal is increased enough to engage them to perform better in the slow condition. However, increasing the speed of the task for these people could be considered to over-arouse them to a point in which they perform worse on the math problems. If the person has high arousal but low anxiety, during the slow task they performed the best over all conditions. This could indicate that their arousal is increased

to the closest point of optimal performance. But then increasing the speed of the task can be considered over-arousing the person to the point where their performance declines substantially. If the person is high in both neuroticism and anxiety, their arousal is pushed beyond the optimal performance level and their performance can drastically decline. Increasing the speed for the high neuroticism and anxiety person only serves to further inhibit their performance. Thus, the Yerkes-Dodson law provides one single explanation for the range of results provided by this study.

These results show that there are actually several factors in predicting performance because of the complex relationship between arousal, task difficulty, and neuroticism. Furthermore, this pattern of performance is task dependent in that different tasks may require different levels of arousal to significantly affect performance. This could be seen in the results as analysis found a significant difference in scores between tasks for the more complex math problems, but this difference was not found in the more simple word recognition task. This could be that the word recognition task was not taxing enough on the working memory system, thus it did not arouse participants enough to affect their performance levels.

These results could be applied in the working world in that management can take into account that people need different levels of arousal for different types of tasks in order to achieve optimum performance from them. Further clarity in the linkages between personality and performance in terms of arousal levels could allow employers to be more conscientious about how they need to stimulate each employee differently to obtain the best levels of performance from them.

In agreement with research done by Matthews et al. (2006) and Hough, Ones, and Viswesvaran (1998) future directions of research should attempt to link the Five Factor Model traits with other specific tasks to attempt to increase correlations and further enhance our understanding of the relationship between personality and performance. Future research directions could also look into ascertaining the appropriate levels of arousal for more specific, relevant tasks which would increase people's performance to more optimum levels. To improve upon this study, it would be important to gain a more representative sample of the public to evaluate in these measures.

In conclusion, this study enhances our understanding of the factors involved in performance. Although only neuroticism was found to have a significant effect on performance, analyzing its interaction with task difficulty and anxiety levels provides an important look into what can determine performance levels. Through this study it is hoped that people will become more aware of how their levels of arousal can affect their performance in different situations. The effects of stress and over-arousal on health are still an essential area which needs to be investigated even though the relationship appears to be complex. While stress and personality can have significant effects on the complex interactions with performance, finding better ways to control stress in the work place is still important.

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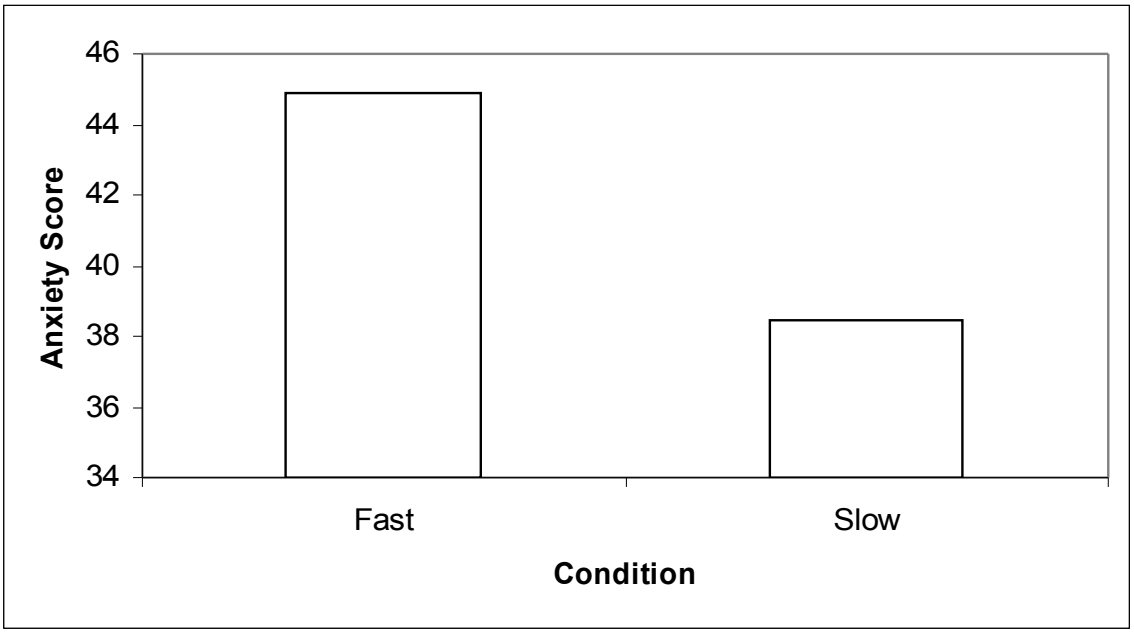
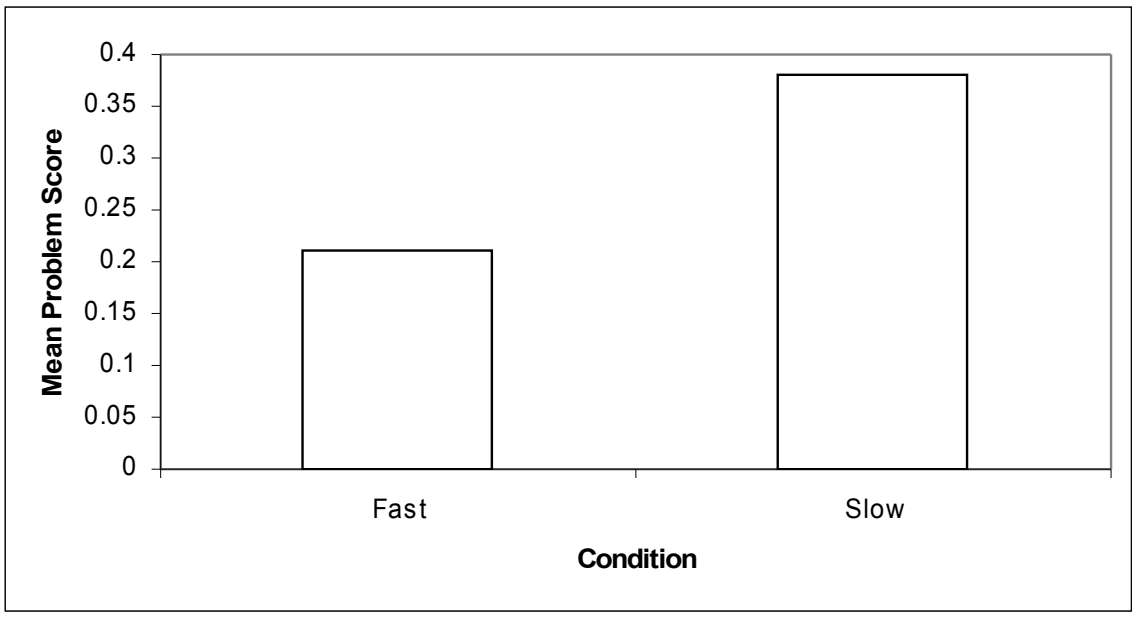
Figure 1. Difference in means between anxiety levels across tasks.



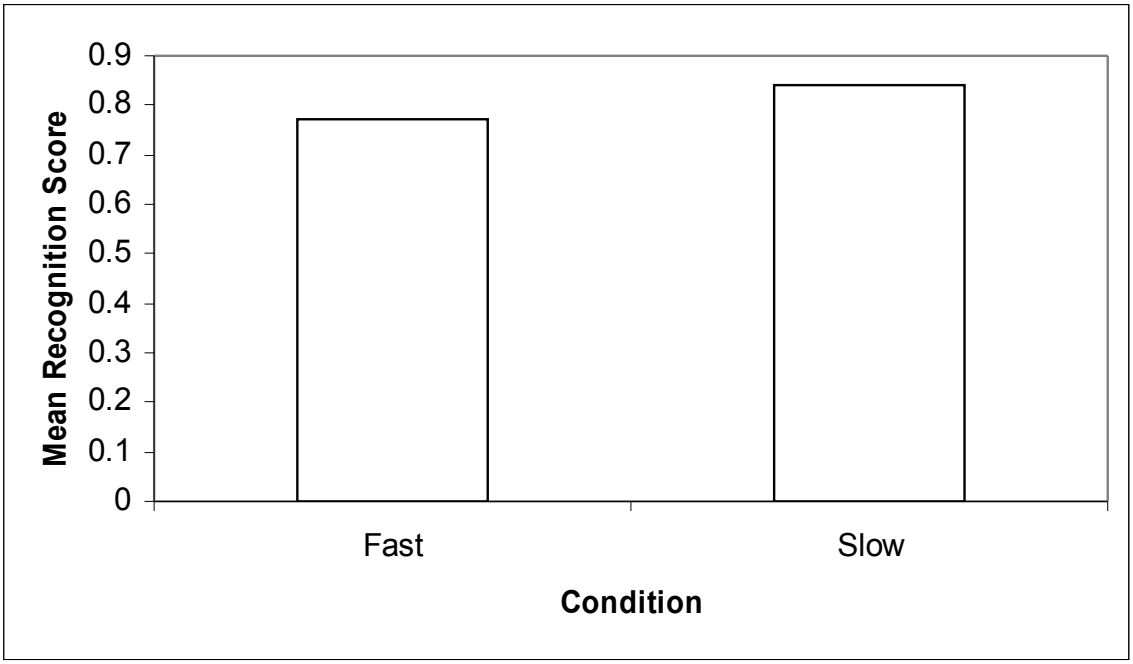
$t(31) = 6.40, p < .001$

Figure 2. Difference in problem scores across tasks.



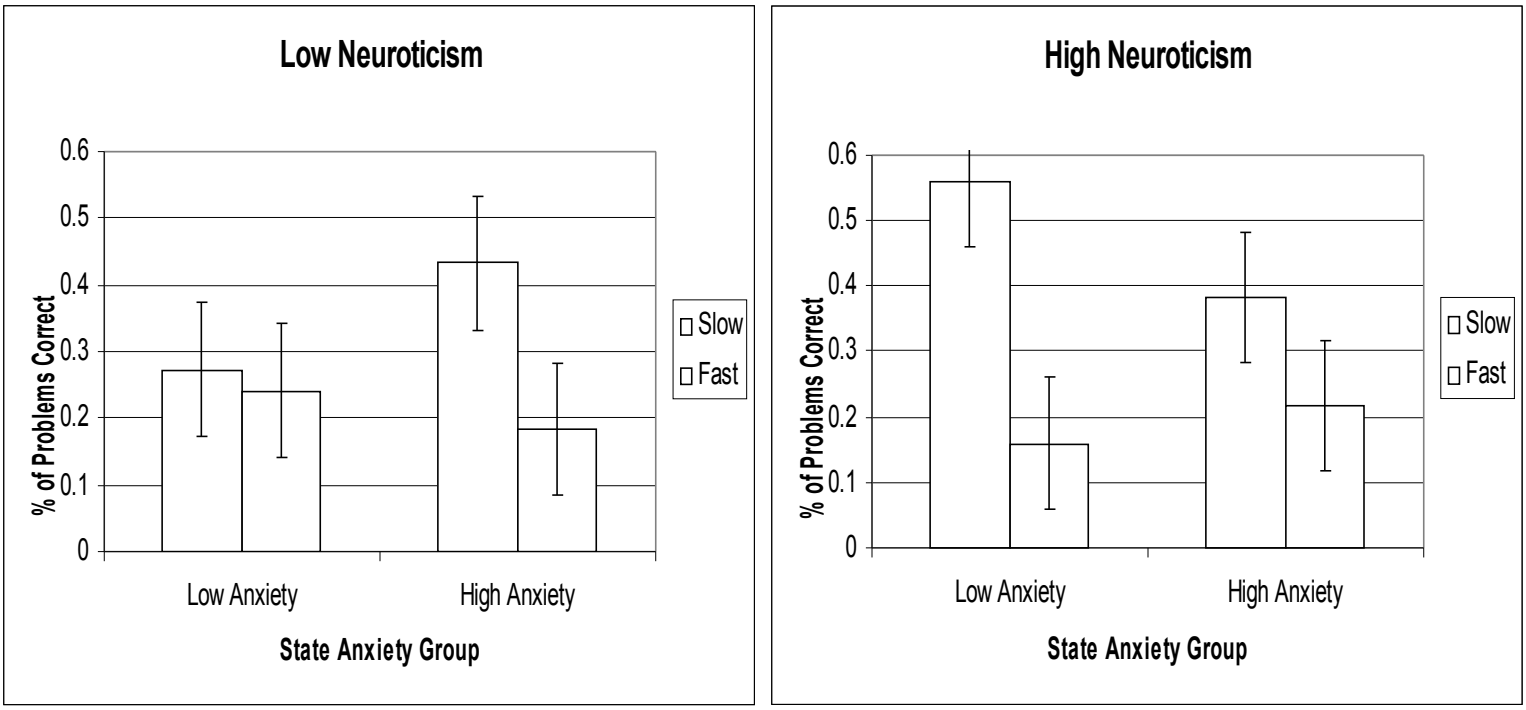
$t(30) = -4.55, p < .001$

Figure 3. Difference in recognition scores across tasks.



$t(30) = -1.41$, $p = .17$

Figure 3. Influence of neuroticism, anxiety, and speed on performance on math problems.



$F(1, 27) = 11.73$, $p = .002$

Figure 4. The Yerkes-Dodson law.

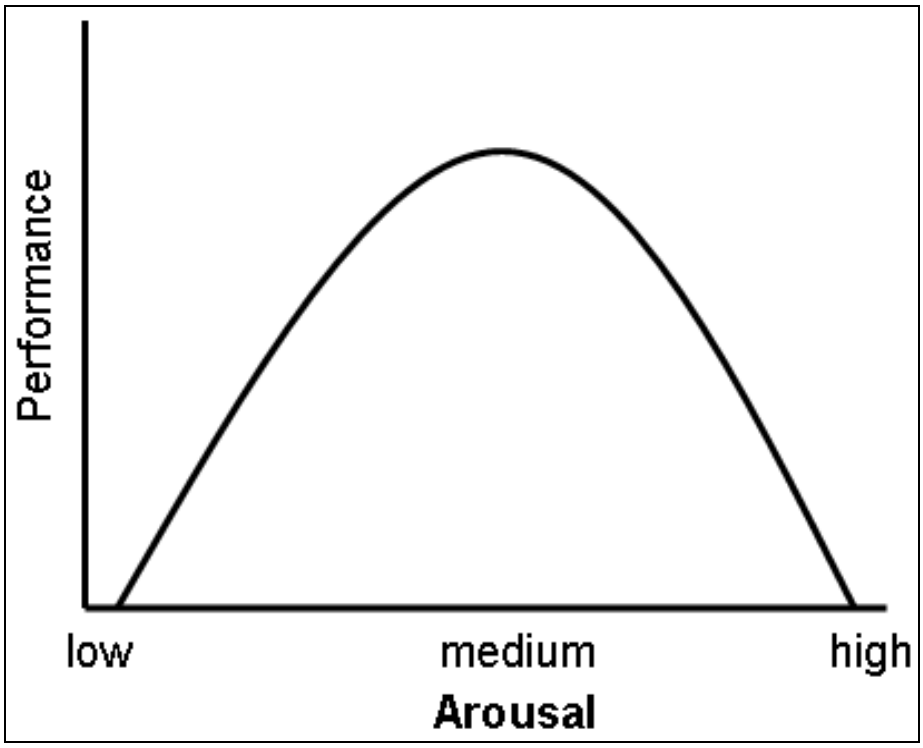
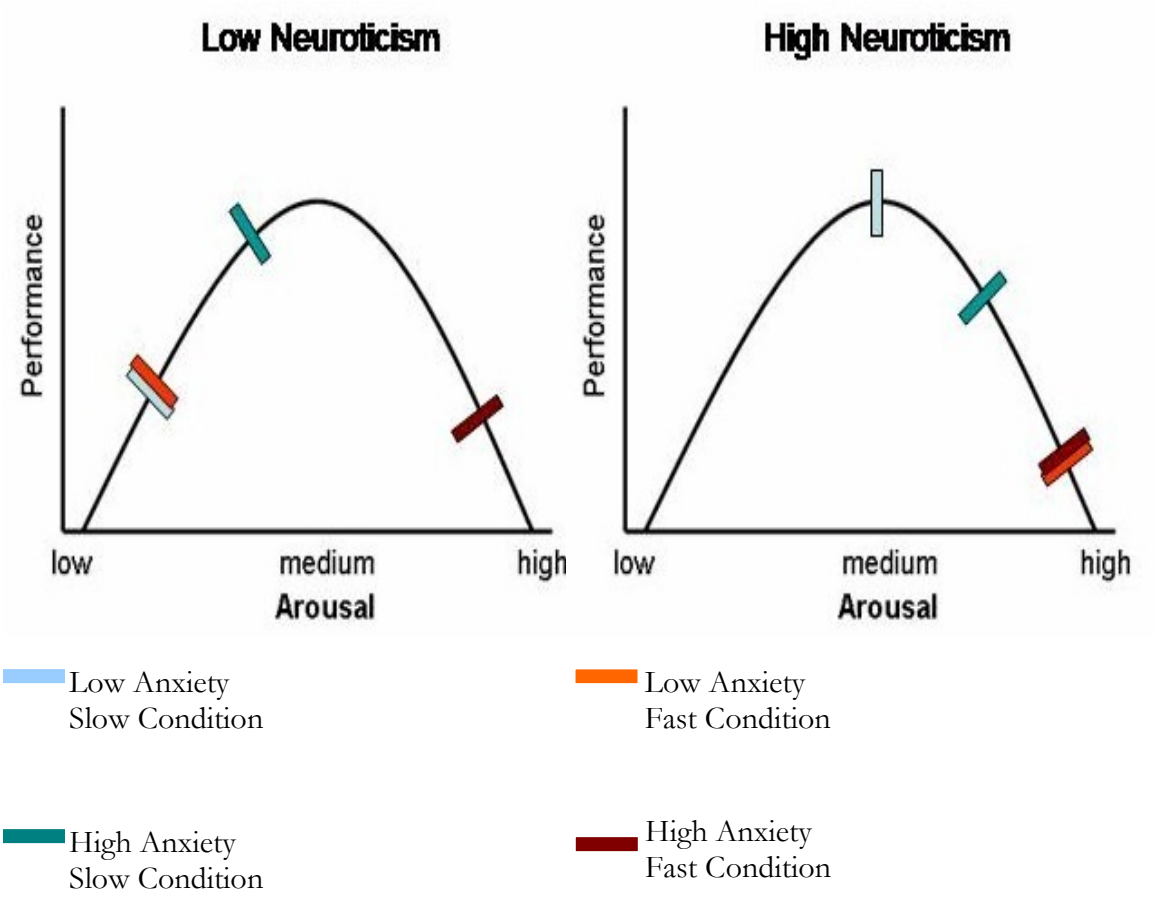


Figure 5. Three-way interaction results in their relative position on the Yerkes-Dodson graph.



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High-frequency concrete noun list:

1. mountain
2. game
3. cereal
4. whiskey
5. medal
6. helmet
7. church
8. pill
9. letter
10. car
11. hand
12. statue
13. boat
14. trailer
15. needle
16. cotton
17. crystal
18. sheep
19. eye
20. parent
21. forest
22. road
23. table
24. water
25. money
26. mother
27. flower
28. university
29. animal
30. dog
31. heart
32. cigarette
33. ship
34. bus
35. plant
36. athlete
37. stone
38. wheel
39. pickle
40. kill
41. remember
42. listen
43. milk
44. allow
45. grow
46. cover
47. begin
48. keep
49. build
50. ask
51. become
52. wood
53. woman
54. window
55. draw
56. describe
57. earth
58. coat
59. truck
60. alcohol

Math Problems:

19 + (18 X 3) = 73 c

84 X (1/4) = 22 w

6/3 + 2 = 5 w

14 X 3 + 17 = 58 w

22 – (8/2) = 16 w

(48/12) X 4 = 16 c

3 X (18-40) = -66 c

12/4 + 8 = 12 w

139 + (54/2) = 166 c

(227–17) X 3 = 630c

3(12) + 11 = 49 w

(18 – 13) + 2 = 7 c

(3-4) + 4 = 7 w

(21/7) + 3 = 6 c

99 X (1/3) = 66 c

(14-3) X 2 = 24 w

33 + (14 X2) = 51 c

(36/18)12 = 22 w

8 + 3 – 4 = 8 w

74/2 X 4 = 148 c

(12-27) X 3 = 45 w

7 + (18 X 2) = 42 c

(223 X 3) + 6 = 677 w

36 + (144 x 1/2) = 113 w

125/5 X 7 = 175 c

42 - 13 + 8 = 36 w

123 – 14 + 8 = 117 c

(88 + 16) X 2 = 208 c

15 X 8 + 8 = 128 c

453 – 14 + 5 = 439 w

27 X 3 + 9 = 90 c

(88 – 3) X 2 = 160 w

44 X 3 + 7 = 140 w

(66/3) + 17 = 39 c

(127 X 2) + 6 = 264 w

15/3 X 6 = 30 c

(47 – 14) + 8 = 51 w

16/2 X 9 = 63 w

(86/2) X 4 = 122 c

(14 X 3) +7 =