Stress and task difficulty's effect on math test scores

Craig Rice
Stephen F. Austin State University

Stress is inevitable. It is beneficial in small quantities can create prolonged and unmanageable stress can be incapacitating, damaging, and can lead to counterproductive habits (Selye, 1956).

In the current study, the effects of stress on students' academic performance will be assessed in order to help gain a better understanding of stress in the realm of college life.
Shaikh et al. (2004) assessed the perception of stress as well as coping strategies of medical students. The study indicated that the results of prolonged stress were low mood (depression), inability to concentrate, loss of temper, and decreased academic performance. Shaikh et al's. study provides great insight into possible causes, outcomes, and solutions to stress in higher education students.

Cassaday and Johnson (2002) examined the cognitive element of test anxiety as it pertained to academic performance. Their study demonstrated the inverse relationship between test anxiety and exam performance, with students scoring lower on exams when they had higher levels of test anxiety.

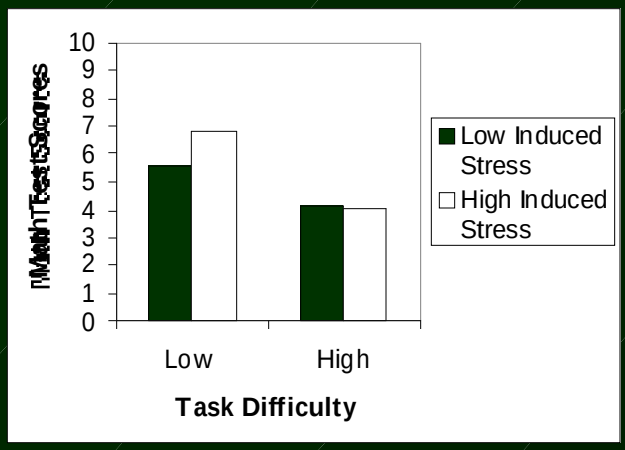
After looking at these studies, it seems evident that further examination is necessary before any progress can be made in overcoming the epidemic that is stress. It is hypothesized that, individuals with high stress levels will exhibit lower academic performance than those with low stress levels. It is also hypothesized that individuals in high task difficulty conditions will have lower academic performance than the individuals in low task difficulty conditions.

METHODS

Participants
40 participants were recruited from a medium-sized university in East Texas. The age range of the participants was from 18 to 31 with the mode being 19. Participant's ethnicity also varied with 21 Caucasians, 11 African-Americans, 6 Hispanic, and the remaining participants being of another ethnicity. Regarding classification, 19 were freshmen, 9 were sophomores, 7 were junior, and 5 were seniors.

Design
This study was conducted using a 2 induced stress (high, low) x 2 task difficulty (high, low) factorial design experiment. The dependent variable will be performance on the task. For each participant, the number of correct answers out of the ten math questions from the task difficulty section was recorded as the dependent measure.

Materials and Procedure
Participants were then given a five minute stress inducing test in accordance with their high or low induced stress conditions. Upon completion of the stress inducing test, participants were given 15 minutes to finish a math test with ten questions according to their high or low difficulty conditions. Once this task had been completed, participants were asked to complete the short demographics questionnaire. Participants were then debriefed and thanked for their participation



RESULTS

In order to investigate possible covariates, each measured extraneous variable (age, gender, race, classification, SAT score, knowledge of study's purpose) was correlated with the dependent variable scores. SAT scores approached significance, r (38) =.30154. Students having higher SAT scores scored better than the students with lower SAT scores.

The current study made use of a 2 (induced stress) x 2 (task difficulty) between ANCOVA, with SAT scores as a covariate.
A main effect was found for task difficulty, with low difficulty leading to higher scores (M=6.1704) than high task difficulty (M=4.0796), $F(1, 35) = 12.86$, $p < .01$. The ANCOVA did not show any significant main effects between low and high induced stress conditions. Furthermore, there were no significant interaction effects between the conditions themselves (see figure for a graph of means for all conditions).

Discussion

As hypothesized, participants in the high task difficulty condition scored lower than participants in the low task difficulty condition. However, there was not a significant difference between low induced stress and high induced stress conditions. The lack of significant findings between the high and low stress conditions are inconsistent with the results of Shaikh et. al. (2004). It is possible that the findings of the current study did not support this evidence for Two reasons. The lack of difference between the condition's induced stress levels could be explained by Selye (1956) who said that prolonged and unmanageable stress could have incapacitating effects. However, due to his lack of a concrete definition of the terms "prolonged" and "unmanageable", it was necessary to make an estimate. A second possibility is that students in both high and low induced stress conditions were cognizant, due to the informed consent form, of the fact that there was neither a reward for high test scores nor punitive measures for low test scores. This lack of stimulating motivational factors left the participants with little reason to take their performance seriously or give a concerted effort.

Although there was not a significant finding in regards to stress, there was the predicted significant effect for task difficulty. This effect demonstrated that participants in the low task difficulty condition scored higher than participants in the high task difficulty condition. This result is important because it verifies the effectiveness of the task difficulty conditions, which could then be used by future researchers who are conducting similar research.
In retrospect, there are several aspects of the current study that could have been altered in order to create a more sound study.

•Implement motivational factors, such as a reward dependent on high test scores, so that participants take the tests more seriously.

•Run a pilot study in order to assess the validity of the stress inducing conditions.

•Increased Sample Size in order to increase generalizability and confidence in results.
In spite of its possible limitations, this study offers some promise towards the future understanding of stress. Its findings could be very useful in the creation of future studies inquiring about the effects of stress and task difficulty on test scores or general academic performance. Although this study has not obtained a cure for stress, it has taken a step in developing a more thorough understanding of stress and its effects. With this understanding, it is possible that new and more effective coping strategies will be developed that will inoculate man from the negative effects of stress.

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