

Stress and its Effect on Academic Performance

Research Question: To what extent does stress effect a college student test performance?

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Introduction

Stress can be defined as “a feeling of being overwhelmed, worried or run-down” (APA, 2018) or in other words stress is the body’s ability to respond to change. But to what extent can stress affect a college students’ academic performance? There are many theories that propose ideas to such question. Alia Crum conducted a study on the management theory. This theory states that with a beneficial mindset on stress, stress may actually help a student perform at a higher performance (Crumb, 2014). However, a study conducted by Sian L. Beilock had two theories that contradicted Crums. This study examined the distraction theory and the explicit monitoring theory. The distraction theory states that distraction competes with the attention that is normally devoted to academic performance. The explicit monitoring theory states that when pressure is put on performance anxiety and self-consciousness increase about performing correctly (Beilock, 2005). Although stress does affect performance negatively (as we tend to believe) there are many stressors that create such tensions. Such stressors can be managed if the student gets to know more about the type of stress they suffer from. Stress is often times seen as an educational enemy because it has a lot of setbacks. But throughout research and examination of studies viewpoints of stress and its effect on academic performance can be challenged and give one a better understanding of such topic.

Types of Stress

Biology of Stress.

When a stressor is sensed and interpreted the hypothalamic pituitary adrenal axis starts up multiple biological events. Events in which we release cortisol and adrenaline (stress hormones). Once a stressor is perceived the pituitary glands receive a chemical message sent from the hypothalamus. The chemical message is then sent through our blood to the adrenal glands. In

order to function stress hormones must bind to receptors (a message is carried by stress hormones telling cells in the body what to do). Before a message can be carried out hormone receptors must receive the message. Once cortisol attaches to receptors it interacts with other cells to interpret the situation and start working. (CSHS, 2017)

Stress is often viewed through a singular perspective, however, there are three types of stress with differing characteristics. As stated by the American psychological association the three types are acute stress, episodic acute stress, and chronic stress. With differing characteristics, managing such stress may perplex a college student if they are not aware of the type of stress they are experiencing. In order to effectively manage stress students should understand the type of stress, they are experiencing. (APA, 2018)

Acute Stress.

The American Psychological Association states that acute stress is the most common type of stress “it comes from demands and pressures of the near future,” (APA, 2018). Acute stress may be beneficial in small doses, however, too much becomes tiring. When a student has too much stress it leads to negative stress (distress) This type of short-term stress is the most common in college students. (APA, 2018)

Symptoms.

A symptom of acute stress is emotional distress. Such distress is often a mix of three stress emotions, anger, anxiety and depression. Muscular problems are also very frequent with acute stress. Such problems are seen through headaches, back/jaw pain, and tension that may lead to a pulled muscle. Furthermore, stomach, gut, and bowel problems can be seen through acute stress. Many experience heartburn, an acid stomach and/or constipation.

Acute stress is the most manageable and treatable stress among the three types of stress, however, it still leads to an academic setback. (APA, 2018)

Episodic Acute Stress.

Episodic acute stress is reoccurring acute stress. Those who live with episodic acute stress live their life in chaos. For instance, they are always rushing to get somewhere but get there late. The American Psychological Association states “If something can go wrong, it does. They take on too much, have too many irons in the fire, and can't organize the slew of self-inflicted demands and pressures clamoring for their attention,” (APA, 2018). These factors are often conveyed through their actions and emotions. Often episodic stress is formed from worry. They tend to see a catastrophe in every situation. They see the world as an awful place where something bad is always going to happen causing stress. Their nurture has led them to behave this way due to past life experiences, it also has to do with their nature. Their nature determines how they behave in their nature. (APA, 2018)

Symptoms.

Symptoms of episodic stress often include ceaseless worrying. They tend to feel that the world is full of disasters and see catastrophe in every situation. Often, they are seen as pessimists because they see the world as a harmful and unrewarding place where nothing beneficial ever happens. Those who suffer from episodic stress may experience long periods of depression, anxiety, and emotional distress. Also, they experience symptoms of extended over arousal in which include tension headaches, migraines, chest pain, and heart disease. (APA, 2018)

Many sufferers resist change, they are only on a treatment if it is promised pain will be relived.

Chronic Stress.

Chronic stress is the third and final type of stress. This is long-term stress in which “destroys bodies, minds, and lives” (APA, 2018). This type of stress is present when a person can’t find a way out of a horrible situation. It’s the stress that never seems to go away, with no sense of hope. The individual loses hope and gives up on finding a solution to their stress.

Chronic stress comes from previous experiences that are painful and traumatic and are present for the rest of their existence. People often get used to the suffering and the feeling of pain, that they forget they have it. Although, many forget about their stress they wear down to a fatal breakdown. Because it is long-term and faces mental and physical challenges, chronic stress becomes difficult to treat. Treatments often require extended medical, treatment for behaviors, and stress management. It may even kill people through violence, heart attacks, suicide, strokes, and even cancer. Chronic stress is by far the most difficult to treat due to its long-term effects. (APA, 2018)

Causes of Stress in Students

College students are exposed to multiple stressors during their schooling experience. Many adjustments to new environments, workloads, and time management are made as well as other factors are made in college. There are six main domains of stress that were studied by professors at *Universiti Kebangsaan Malaysia*.

The study *Stress and Its Association with the Academic Performance of Undergraduate Fourth Year Medical Students at Universiti Kebangsaan Malaysia* was conducted by professor Harlina Halizah Sirajin. The study was conducted to explore stress and its different stressors. It was also used to determine the correlation between stress levels and grade point average of college students. Many college students are often stressed due to multiple stressors (such as

academic, financial, health, or family related) this often leads to a negative effect on academic performance. (Siraj, 2014)

A cross-sectional questionnaire survey was conducted on 179 students from *Universiti Kebangsaan Malaysia* (2011-2012). There were 40 possible sources of stress on the questionnaire. Each participant rated each stressor on a 0-4 scale (0 causing no stress and 4 causing severe stress). The students' academic performance was measured by their gpa of semester 1 (5.0 scale). It was found that the main stressors students dealt with were finances, health, academics, and loss of a close family member or friend. Harlina H Siraj states. "There were six domains of stress that were studied, which were Academic Related Stressor (ARS), Intrapersonal and Interpersonal Related Stressor (IRS), Teaching and Learning Related Stressor (TLRS), Social Related Stressor (SRS), Drive and Desire Related Stressor (DRS) and Group Activities Related Stressor (GARS). Among these domains, the stress level was severe (84%) in the academic related stressor (ARS)," (Siraj, 2014). 129 students that participated in the experiment were female (72%) and 50 were male (28%). 84% of participants were in severe stress (4 on the scale) with the main stressor being academics. (Siraj, 2014)

There was a large correlation between academic performance and stress. The correlation was negative, however, if students manage their stress, they are able to perform well. A weakness of the study was that not every medical student participated. A strength was that they explored specific stressors. This study could be a guideline for future studies about academic related matters and educational performance. (Siraj, 2014)

Benefits of Stress

A positive mindset about stress creates many beneficial factors in a student's academic performance by retooling the body's response. Stress is the body's ability to respond to a change.

When the body adapts to a situation it becomes very difficult to cope with change. However, by viewing stress as beneficial the body also acts beneficially towards the situation.

The study *Rethinking Stress: The Role of Mindsets in Determining the Stress Response* conducted by Alia Crum, Peter Salovey, and Shawn Achor was inspired by the stress management theory which states that stress is beneficial until a certain point. Stress responses are driven by the coping mechanism of the individual (combating stress). They proposed that if one has a stress enhancing mindset then the more likely one is to meet goals and vice versa (Crum, 2012). 63 undergraduate students in the Northeastern US in a personality psychology course participated (mean age:19, 62% women). Personality variables and health were measured through salivary hormone measurements. They were given instruction on when three salivette samples were going to be taken. On their “baseline day”, the cortisol samples were taken at the beginning (0 min.), middle and end (30 min/60 min). However, on “stress day” participants took the Trier Social Stress Test (TSST). The participants were then asked to prepare a speech that they would deliver charismatically to the class. Five participants were randomly selected and were told that their peers would evaluate their charisma. They were also told they would be videotaped and evaluated by experts from a business school. They had the ability to receive feedback from anyone. They were given questions about their comfort of receiving feedback and their willingness from 1 (not comfortable/not willing) to 9 (very comfortable/very willing). The results showed that more cortisol was produced in an hour on “stress day” compared to baseline day ($t(63) = 3.71, p < .001$). 75 % of those selected to speak in front of the class chose to receive feedback. The willingness of receiving feedback was a 6 and a 5.14 on receiving feedback (scale 1-9). Stress mindset and cortisol reactions had a notable interaction. (Crum,2012)

Those with a stress-is-enhancing-mindset were more likely to want feedback than those with a debilitating mindset. With an enhancing-mindset, one is more likely to find behaviors that help meet a goal. Feedback was a growth opportunity in the study which could be used in the future. Participants with high cortisol stress reactivity had a lower cortisol response with the stress-is-enhancing-mindset and vice versa. A weakness of the study was not directly measuring performance effects of seeking feedback. Though that did lead to a strength, future personal enhancement was stimulated by feedback seeking. This study investigated areas where stress mindsets influenced behavior and health, but it failed to measure many outcomes and processes simultaneously. Future research on such topic should include multiple measures in the mechanistic pathway to have a better explanation of what links the mind with performance outcomes. (Crumb,2012)

Disadvantages of Stress

Distress is often created from worry and high standards which lead to poor test performances. Students often jump to negative conclusions creating more stress in a situation than there should be. Students then focus too much on their stress instead of looking for a solution resulting in poor test performances, in this case math.

The study *More on the Fragility of Performance: Choking Under Pressure in Mathematical Problem Solving* conducted by Sian L. Beilock (a psychology professor) was used inspired by the self-focus or explicit monitoring theory as well as distraction theories. Self-focus or explicit monitoring theories propose that when pressure is put on performance anxiety and self-consciousness increase about performing correctly. Their attention then increases on skill processes and step by step control. On the other hand, distraction theories propose that the distraction (pressure in this case) competes with attention that is normally devoted to

performance. The aim was to examine mathematical test performance under pressure with working memory requirements that may make the participant susceptible to poor performance. (Beilock, 2005)

Experiment 1.

Three experiments were utilized to examine mathematical performance under pressure. The first experiment consisted of 40 enrolled students at Michigan State University. It was made sure that these students were not math majors and that they had no exposure to modular arithmetic. Each participant was chosen randomly into a low-pressure group or high-pressure group. Each participant had to fill out a consent form and demographic sheet describing their previous math experience. They were then told that the purpose of the study was to examine how each participant learned a new skill in math. Each participant sat in front of a computer screen with instructions on a computer screen about solving modular arithmetic problems. These individuals were then told to judge how valid the math problem was (as quickly as they could but without sacrificing accuracy). When they had an answer, they were to press either the T or F key. Each participant performed 72 arithmetic problems. (Beilock, 2005)

According to the questionnaires, participants in the low- and high-pressure group did not significantly differ from each other when it came to importance of performing at a higher level. On average participants from both groups self-reported that performing at a higher level was not their priority. However, participants in the high-pressure group showed a higher state of anxiety. Also, those participants in the high-pressure group self-reported feeling more pressure than those in the other group. All in all, participants in the high-pressure group significantly had a poorer performance. The results of the questionnaire show that the manipulation worked successfully by increasing the participants 'feelings of performance pressure and anxiety', (Beilock, 2005).

Experiment one was designed to examine how pressure impacts a task in which the performance should lead to a poor performance according to the distraction theory. Participants performed unpracticed mathematical problem-solving from their working memory demands. The pressure from the scenario increased “feelings of performance pressure, and anxiety reduced accuracy on high-demand problems that draw heavily on working memory,” (Beilock, 2005).

This experiment supports the distraction theory as it explains the choking phenomenon through mathematical problem solving. However, every participant was a novice to the math (modular arithmetic) and with pressure it was still unpracticed. This leaves a possibility that declination of performance (under pressure) may occur during higher levels of practice on modular arithmetic. (Beilock, 2005)

Experiment 2.

The second experiment consisted of students from Michigan State University with no prior knowledge on the topic as those in experiment 1. However, they solved modular arithmetic problems both prior and after practicing problems (low and high pressure). Participants had no exposure to the math prior to the situation, however, after practicing they had been exposed to the problems 49 times.

Each participant had 12 practice problems as their first performance. After practicing they completed “a 12-problem low-pressure test (LP1) and a 12-problem high pressure test (HP1),” (Beilock, 2005). These tests were separated with a small break. Once LP1 was completed individuals were given the same pressure scenario as experiment 1. However, participants in experiment 2 were told they were entering the first of two-test situations and that they had to improve their performance by 20% in order to receive a momentary award for their partner and themselves. After HP1, participants returned to practice problems. The individuals then took a

part in the second part of each test (HP2 and LP2). 12 of the same problems that were presented on the practice test were seen on both HP2 and LP2 tests. As in LP1, individuals did not know about the testing situation for LP2. They believed that LP2 was just a set of practice problems. The experimenter then informed the participant that they were taking part in the second test scenario (high pressure, instructions that they needed to improve by 20% in both tests, recorded). Participants were then debriefed and given the reward regardless if they met the requirements or not. (Beilock, 2005)

This experiment did not include a self-report measure (would not be very accurate), instead, it was a within-participants design. Behavioral evidence did, however, show that the manipulation was effective. Results showed that practicing problems eliminated initial time differences.

Experiment 3.

Experiment 3 used 28 students from Miami who did not major in math and reported no exposure to modular arithmetic. These participants were exposed to over 700 practice problems prior to low- and high-pressure tests.

Participants had 720 practice problems. After practicing, participants took a 36-problem low-pressure test as well as a 36-problem high-pressure test. Participants filled out a verbal thought questionnaire after the high-pressure test in which gave an insight of their personal thoughts during the high-pressure test. Individuals also filled out the State Anxiety form of the STAI. They answered questions regarding how important they viewed the importance of high performance during the high-pressure test, perception on performance pressure, and if they thought they performed well in the high-pressure test. These individuals were also debriefed and given a momentary award regardless of performance. (Beilock, 2005)

The responses were divided into five different categories.

1. Thoughts on high-pressure situation and consequences

“I am not going to get the money”

“I hope I don’t look stupid”

2. Thoughts on steps to perform math problem

“19 does not equal 9”

“First I looked at the digit in the one’s place of the number being subtracted.”

3. Thoughts on increased focus on a specific aspect of solving math problems

“A desire to focus on the screen.”

4. Thoughts on lack of perceived pressure

“Since I did not know the person, the pressure to improve was not that heavy.”

5. Thoughts that were unrelated to the study

“I thought about what I was going to do today.” (Beilock, 2005)

Participants reported that performing at a higher level was moderately important during the high-pressure test. High state of anxiety levels were reported by the individuals. These individuals had a state of anxiety beyond that of the control group. Participants performance pressures were significantly higher than those reported from experiment 1. Their performance success was significantly lower than those in experiment 1 (low pressure group).

Those in experiment 3 reported higher anxiety levels, heightened perceptions of performance pressure, and they thought they did worse than those in experiment 1 (low pressure group). The pressure manipulation was successful.

The study was used to “explore the impact of pressure in a task with a control structure that might make performance susceptible to choking via distraction.” In the first experiment

problems that did not require working memory were performed better with pressure. In experiment 2, when problems were practiced and answers were retrieved from long term memory into working memory, errors were no longer seen. As in experiment 3, performance improved on problems with low demands from the working memory while being under pressure. The study was generalized through answers on true or false which may have impacted the results. However, participants did go through the math process to retrieve their answer. All in all, distraction and explicit monitoring are “viable explanations for the choking phenomenon,” (Beilock, 2005), Researchers might be able to find the exact mechanisms that show performance patterns under pressure through each theory. (Beilock, 2005)

Managing Stress

There are both benefits and disadvantages to stress. However, when the disadvantages take over there are ways to manage this stress. Psychological research has shown that these two techniques have reduced long- and short-term stress. The first technique a student can take is to step away from the stressor (APA, 2018). This allows the student to do something else to feel less overwhelmed. Although they will eventually go back to that stressor it is healthy to take a small break from the problem. Another way a student may manage stress is through exercise (APA,2018). Long-term benefits come from exercise to the body and mind. Exercise releases endorphins in which reduce stress.

The study *College Students' Time Management: Correlations with Academic Performance and Stress* conducted by Robert L. Dipboye and Amanda Peek Phillips was utilized to find a coping strategy for stressed college students. The examiners developed a time management behavior scale (TMB) before starting their process. Four factors were used,

1. Setting Goals and Priorities

2. Planning, Scheduling
3. Perceived Control of time
4. Preference for Disorganization

165 college students participated. The participants began by completing the time management questionnaire on a scale of 0-4 (0 seldom true to 4 very often true). Scores ranged from 0-184. In addition, they also completed seven scales that are stress related ("role ambiguity, role overload, job tension, somatic tension, job satisfaction, life satisfaction and Type A-B behavior pattern"). Subjects were then asked to characterize themselves as a "morning", "night", or "neither" type of person. (Dipboye & Phillips, 1990)

The TMB results were composed of the sum of all 46 items. The interitem reliabilities for the overall score and each of the factors were: overall- .68, factor 1- .83, factor 2- .62, factor 3- .69, and factor 4- .60. These results showed moderate internal consistency. The overall TMB score correlated with role ambiguity, job and life satisfaction, somatic tension, GPA, and self-rated performance. Factor three allowed participants to increase their performance and GPA. Those who set goals reported better school performances. Furthermore, participants who planned and scheduled reported to have less ambiguity but higher GPA's, self-ratings, and a better life satisfaction. Those who were more organized were also reported to have higher GPA's. (Dipboye & Phillips, 1990)

This study showed that time management is multidimensional and relationships between time management and self-reported performance and stress were important. Throughout multidimensionality, the four factors were revealed. Such findings as the ones above indicate that it is important to distinguish different time management factors. A second finding showed that time management is correlated with stress and performance. Those who practice time

management know more about their role and perform at a higher level. A limitation of the study is how reliable the self-reported measures are. The samples were also fairly small. A strength of the study is that it is in the right direction of developing a measurement for management behaviors.

Future research can be done on stress causing poor time management or finding a third variable that causes the other two variables. These are alternatives that can be used for further research.

Conclusion

In conclusion, stress significantly affects a college student's academic performance if the student allows it to. Most college students suffer from manageable acute stress; however, such stress still leads to an academic setback. Many stressors contribute to the declination in academic performance, but mentality is also seen as a contributor. It was concluded that distraction does, in fact, compete with attention that is devoted to performance. It was seen when performance pressure and anxiety reduced accuracy on problems with high demands on working memory. In the 2nd and 3rd experiment it was seen that performance levels increased when stress decreased (by practicing). However, such viewpoint was challenged through Alia Crum's work. Throughout her study, it was seen that those with a beneficial look on stress performed better. But the limitation was the breaking point of that mentality. When was stress too much stress that it lost its benefit?

College students are exposed to multiple stressors in their everyday lives. Many adjustments are made but sometimes one too many stressors can discombobulate a student's performance. It is seen that there is a correlation between the declination of academic performance and stress. However, it is seen that there are ways to manage stress. Time

management allows students to cope and overcome their stress. Those students who learned how to manage time effectively had a higher GPA and a happier life. Stress may be unavoidable for students but if the right mentality and actions are taken a student's academic performance will remain untouched. However, stress is unavoidable and hard to manage unless action to manage it is taken.

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