2007

The Effect of Procrastination and Stress on Low Effort and High Effort Tasks

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The present study was designed to examine the impact of stress and procrastination on high effort and low effort tasks. The participants, 40 undergraduate students, were randomly assigned to one of four experimental conditions. The experimental conditions were Low Effort-High Stress, Low Effort-Low Stress, High Effort-High Stress, and High Effort-Low Stress. It was hypothesized that participants in the high effort-high stress condition would procrastinate more than participants in the other conditions. A 2 x 2 ANOVA was carried out and the results indicated a main effect with stress, and a significant interaction between effort and stress. Issues, such as implications of prior research were discussed. There were a number of control issues that may have affected the results of the study. Ideas for further research were discussed.

Over the years, interest in the relationship between procrastination and stress has steadily increased. A number of studies have been published that explore procrastination and stress on varying tasks. According to Phares and Chaplin (1997), procrastination is the avoidance or postponement of a task while stress is a psychological and physiological state produced by a variety of unpleasant events. Stress is brought about by high states of arousal. According to Petri and Govern (2004), when arousal levels are high, anxiety and stress appear. When arousal levels are low, an individual is usually asleep. An individual tends to be awake and alert when arousal levels are moderate.

In order to make a reasonable case, past research and findings must be considered. Solomon and Rothblum (1984) conducted a study that examined the reasons for
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procrastination as well as the frequency of procrastination on academic-based tasks. The
participants were 342 undergraduate students enrolled in an introductory psychology
course. Procrastination was measured by examining when a student chose to participate
in an experimental session. There were three experimental sessions over the course of the
year, and the students that chose the last one were considered high procrastinators.
Procrastination was also measured by examining the number of self-paced quizzes that
were completed in the last five weeks of class. There were 23 self-paced quizzes that
could have been completed over the course of the school year. The students who chose to
complete most of their quizzes during the last few weeks of class were considered high
procrastinators. The results indicated that fear of failure and the aversiveness of the task
were some of the factors related to procrastination. According to Solomon and Rothblum
(1984), procrastination is a complex interaction of behavioral, cognitive and affective
components. Therefore, procrastination cannot be solely attributed to a deficit in study
habits or time management.

A study conducted by Rothblum, Solomon and Murakami (1986) examined the
relationship between procrastination and academically related trait measures. The
participants were 379 undergraduate students enrolled in an introductory psychology
course. State measures were administered on three separate occasions close to the
approach of midterm examinations. Overall, more than 40% of the participants reported
high levels of procrastination-based tendencies. The results indicated that high
procrastinators were more likely to report test anxiety, weekly state anxiety, and anxiety-
related physical symptoms. Also, high procrastinators were more likely to attribute exam
success to external factors, suggesting an external locus of control. Both high and low
procrastinators perceived exams as less important and less difficult as the exam deadline approached. Similarly, both high and low procrastinators increased their study behavior as exams approached.

A study conducted by Janssen and Carton (1999), examined the effects of locus of control and task difficulty on procrastination. The participants were 42 undergraduate students enrolled in an introductory psychology course. According to Petri and Govern (2004), locus of control is an individual's expectation about the control of reinforcement. Individuals that have an internal locus of control perceive rewards and punishments as a result of their own behavior. On the other hand, individuals that have an external locus of control perceive rewards and punishments as beyond their personal control (e.g., as a result of luck or chance). The students were randomly assigned to either the difficult or easy experimental condition. The difference between the two conditions was in the complexity of the psychology article assigned. The students were asked to read the article and answer a series of questions in written form. The time of submission was used to measure procrastination. For task difficulty, none of the results were statistically significant. However, the results indicated that students with an internal locus of control completed assignments sooner than students with an external locus of control.

Milgram and Toubiana (1999) conducted a study that examined the relationship between procrastination, academic anxiety and parental involvement on academic tasks. The participants were administered self-report measures about their current anxiety level and their current habits of procrastination. The results indicated that students were more anxious about academic assignments, rather than homework. Also, older adolescents procrastinated more on their homework than younger adolescents. In addition, older
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adolescents were generally less anxious about their school work. Milgram and Toubiana (1999) concluded that higher levels of academic anxiety led to higher levels of procrastination, which confirmed the appraisal-anxiety avoidance (AAA) model.

Ferari and Tice (2000) conducted a study that examined procrastination as a self-handicap. The study was made up of two separate experiments. In the first experiment, 59 undergraduate students served as participants. The participants were given 15 minutes to prepare for an “important” mathematical test that would apparently be predictive of cognitive abilities. As preparation, participants could practice similar math problems or engage in other tasks, including puzzles and video games. The results indicated that self-proclaimed procrastinators were less likely to prepare for the important task that was evaluative of cognitive abilities. In the second experiment, 88 undergraduate students served as participants. The design of the second experiment was identical to the first experiment except for the description of task importance. Half of the participants were told that the mathematical task was “important” and would be predictive of cognitive abilities. The other half was led to believe that the task was a “fun game” and that their performance would not reflect cognitive abilities. The results indicated that self-proclaimed procrastinators practiced the same amount as non-procrastinators, which suggests that procrastination occurs as a self-handicap.

Given these past findings and a general understanding of procrastination, this study sought to examine the impact of stress and procrastination on high effort and low effort tasks. It was hypothesized that participants in the high effort-high stress condition would procrastinate more than subjects in the other conditions.
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Method

Participants

Forty participants, both male and female, were used in the present study. The participants were between 18-23 years of age. The participants were recruited from Huron University College in London, Ontario. It is worthwhile to note that Huron University College is a small liberal arts university and there are very few science students at Huron, mainly because a science-based education is not offered. There were no specifications for eligibility of participants and there were no restrictions placed on age, gender, or background of participants. Treatment of the participants was in accordance with the ethical standards of the American Psychological Association.

Apparatus

Participants were given a consent form that outlined the nature of the study. The participants were asked to sign the consent form before continuing on to the rest of the study. They were then e-mailed written instructions regarding the task. In the instructions, participants were asked to complete an essay on a topic of their choice. The length of the essay and the time allotted to complete the essay varied, depending on the experimental condition. The utilized method of measurement was the time required for the participant to complete the essay over the time allotted to complete the essay. If the value exceeded 1.0, procrastination was evident. However, if the participant failed to complete his or her essay after a certain period of time, a value was automatically assigned. The value was assigned by making the assumption that in a best case scenario, the participant(s) in question would have completed the task three weeks (504 hours) after it was assigned. The assigned value (504) was then divided over the time originally
allotted to complete the essay. For example, if a participant was given three days (72 hours) to complete the essay, 504 was divided by 72, which equaled an overall procrastination score of 7.0.

**Procedure**

Prospective participants were individually approached at Huron University College. They were then asked if they would be interested in taking part in a student led psychology study. Upon agreement, participants were e-mailed a set of written instructions depending on the experimental condition that they were randomly assigned to. There were four different sets of instructions that represented the four different conditions (refer to Appendices A through D for further details). The conditions were *Low Effort-High Stress, Low Effort-Low Stress, High Effort-High Stress,* and *High Effort-Low Stress.* Participants in the low effort-high stress condition were asked to complete a one paragraph essay on a topic of their choice and were given three days to complete it. Participants in the low-effort-low stress condition were asked to complete a one paragraph essay on a topic of their choice and were given seven days to complete it. Participants in the high effort-high stress condition were asked to complete a 1-2 page essay on a topic of their choice and were given three days to complete it. Participants in the high effort-low stress were asked to complete a 1-2 page essay on a topic of their choice and were given seven days to complete it. From the exact time that the instructions were given, participants were given either three days or seven days to complete their essay, depending on the condition. For example, if the instructions were given at 3:00PM on Monday, the essay would be due at 3:00PM on Thursday if the participant was in one of the high-stress conditions. The participant was asked to write down the time of
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completion on his or her essay before e-mailing it to the experimenter. Also, they were
asked to send the essay to the experimenter immediately upon completion. Upon
completion of the study, participants were provided with a debriefing form which further
explained the objective of the study. Participants were not reimbursed for their
participation in the study.

Results

Scores on the task were analyzed to determine the degree of procrastination
evident in each student. Scores ranged from .01 to 7.0, with an overall mean of 1.82 (SD
= 1.77). Separate analyses for the experimental conditions resulted in the following
means: low effort-high stress, 1.12 (SD = 1.07); low effort-low stress, 1.33 (SD = 1.02); high
effort-high stress, 3.38 (SD = 2.59); high effort-low stress, 1.46 (SD = 1.00). A
summary of the marginal means for the different experimental conditions is presented in
Figure 1.

A 2 x 2 between-subject Analysis of Variance (ANOVA), used to analyze the data
(see Appendix E for complete data). An alpha level of .05 was used for all statistical
tests. The independent variables were stress (high, low) and effort (high, low). The
dependent variable was procrastination. There were no significant main effects with
stress, F(1, 36) = 2.98, p > .05, but there was a significant main effect with effort,
F(1, 36) = 5.74, p < .05. The results indicated a significant interaction between effort and
stress, F(1, 36) = 4.55, p < .05. Planned comparisons in the form of t tests were used to
assess the difference between cell means. When comparing low effort-high stress to low
effort-low stress, the difference between cell means was not significant, t(18) = 0.30, p > .05. When comparing low effort-low stress to high effort-low stress, the difference
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between cell means was not significant, $t(18) = 0.19$, $p > .05$. When comparing high
effort-low stress to high effort-high stress, the difference between cell means was
significant, $t(18) = 2.74$, $p < .05$. When comparing high effort-high stress to low effort-
high stress, the difference between cell means was significant, $t(18) = 3.23$, $p < .05$. After
examining the results of the planned comparisons, it is reasonable to conclude that the
significant interaction between stress and effort was a result of the differences in cell
means between the high effort-low stress and high effort-high stress, as well as the
differences in cell means between the high effort-high stress and low effort-high stress
conditions.

Discussion

It was hypothesized that participants in the high effort-high stress condition would
procrastinate more than the participants in other conditions. The results indicated that
participants in the high effort-high stress condition procrastinated more than the
participants in other conditions, thus supporting the hypothesis.

In terms of issues, prior research must be examined. The research done by
Solomon and Rothblum (1984) revealed that procrastination is not exclusively a deficit in
study habits or time management. Also, they found that fear of failure and task
aversiveness were some of the factors related to procrastination. From these findings, it
was reasonable to assume that participants in the high effort conditions would
procrastinate more than participants in the low effort conditions, as a result of task
aversiveness. In the high effort conditions, the assigned task could be considered highly
aversive. It was designed to resemble a typical university assignment, although it was
shorter in length. Although the task in the low effort conditions was similar, it could not
be considered highly aversive because it was only one paragraph. The findings of the present study correspond to the findings of the study done by Solomon and Rothblum (1984). As a result of task aversiveness, participants in the high effort conditions procrastinated more than participants in low effort conditions, thus supporting the findings of Solomon and Rothblum (1984).

The research done by Rothblum, Solomon and Murakami (1986) revealed that high procrastinators were more likely to report test anxiety, weekly state anxiety, and anxiety-related physical symptoms. To put it simply, procrastinators were more likely to experience anxiety as a result of their work habits. From these findings, it was reasonable to assume that participants in the high stress conditions would likely experience more anxiety, and as a result procrastinate more, in comparison to participants in the low stress conditions. The findings of the present study did not fully correspond to the findings of Rothblum et al (1986). Participants in the low effort-high stress condition exhibited the least amount of procrastination out of all the experimental conditions. This may have been a result of the easiness of the task. However, participants in the high effort-high stress condition exhibited the highest amount of procrastination, which supports the findings of Rothblum et al (1986).

The research done by Janssen and Carton (1999) revealed that task difficulty did not have a significant effect on task completion. The results of the present study did not support the findings of Janssen and Carton (1999). A parallel can be drawn between effort, in the present study, and task difficulty in the study done by Janssen and Carton (1999). Effort was manipulated by assigning either a 1 paragraph essay (low effort) or a 1-2 page essay (high effort). Janssen and Carton (1999) manipulated task difficulty by
assigning either a complex psychology article or a simple psychology article. This shows the similarities in the two studies between effort and task difficulty. Although Janssen and Carton (1999) manipulated task difficulty, it is possible that neither of the articles served as a challenge to participants. Also, it is possible that participants did not take the task seriously, regardless of the experimental condition that they were assigned to. As a result of this, the participants may have put very little effort into completing the task, which may have skewed the results.

The research done by Milgram and Toubiana (1999) revealed that students were more anxious about academic assignments and that higher levels of academic anxiety led to higher levels of procrastination. The results of this study were similar to the results of the Rothblum et al (1986) study in that there appeared to be a relationship between procrastination and anxiety. From this it was reasonable to assume that participants in the high effort-high stress condition would procrastinate more than participants in other experimental conditions. The basis for this assumption was that participants in the high effort-high stress condition would likely experience more anxiety due to the length of the essay, as well as the time constraint placed on the completion of the essay. Analogous to the findings of Milgram and Toubiana (1999), the assigned task (writing a 1-2 page essay) should have induced anxiety because of its resemblance to a real academic assignment. Participants in the high effort-high stress condition did procrastinate more than the participants in other experimental conditions, thus supporting the findings of Milgram and Toubiana (1999).

The implications of these past findings paved the way for the hypothesis of the present study. Furthermore, prior research provided the building blocks for this study.
The major problems that must be discussed are control and sampling. The experimenter approached prospective participants at different times of the day and in different locations at Huron University College. After participants agreed to take part in the study, a set of written instructions were sent to the participant through e-mail. Sending instructions through e-mail may have been problematic because there is no way to ensure that participants regularly check their e-mail. Also, some people may not have access to the internet in their personal environment and so their ability to participate may have been hindered. Another problem that arises is there is no way to ensure that the e-mail actually sent or that the participant received the e-mail. In addition to the problems mentioned above, the prospective participants were approached during a critical academic period. During this critical period, people tend to have essays, assignments and final projects to complete, as well as final examinations to prepare for. Therefore, the task at hand may have been a last priority for many individuals, as a result of their own personal obligations and academic workload.

Another control issue that must be mentioned involves the lack of motivation evident in participants. As was mentioned previously, participants were not reimbursed for their participation in the present study. As a result of this, participants had no motivation or incentive to complete the task. In fact, a number of people agreed to participate and did not end up completing the task. This created a problem because it was hard to get participants to complete the task at hand. This issue could have been resolved by offering monetary incentives. However, this was not feasible for the experimenter from a financial standpoint. Also, this design (completing an essay by a certain deadline) was chosen to imitate a real life academic situation in which students are required to
complete essays and assignments by a certain deadline. In these real life situations, students are not rewarded for completing their essays on time. On the other hand, it can be argued that students are motivated to earn high marks, which may be the reason that they complete essays on time. Furthermore, the possibility of earning high marks serves as an incentive for many students to submit essays and assignments on time.

In terms of sampling, some issues must be discussed. There were no restrictions or specifications for eligibility of participants. As a result of this, the nature of the sample was unknown. Although the method of sampling was not ideal, the sample was still respectable because there was a wide range, and thus more variability. However, the sample was quite small and as a result of this, may not have been representative of the population. Also, the participants were not randomly selected which may have had a negative impact on the results. The issue of sampling could have been improved by taking a larger, randomly selected sample that would ensure further variability, as well as the ability to generalize the results to the larger population.

From the results of the present study, several suggestions for future research can be made. It would be worthwhile to re-conduct the present study with an elimination of the control issues mentioned. Also, it would be interesting to re-conduct the present study while offering monetary incentives to participants. From this it would be possible to examine whether there are any significant differences in data that may result from the monetary incentive. In addition, it would be interesting to conduct a study that compared the procrastination habits of individuals in college, university and graduate school. It can be argued that the academic demands differ depending on the type of institution. The varying degrees of academic demands would affect the overall anxiety level of an
individual. For example, graduate school is likely the most demanding and so an individual in graduate school would have a higher anxiety level than an individual in college. From this, it would be interesting to examine the differences in procrastination levels to determine if anxiety plays a significant part in academic procrastination. Lastly, it would be worthwhile to conduct a study that compared psychology students to non-psychology students to see whether there are any significant differences in work/ study habits.

The practical implications of this line of research relate to all different aspects of life. Stress and procrastination are two of the key features evident in universities across the world. Obviously these two features are not exclusive to universities, but they appear to hold a prominent place in the lives of university students. If there is any doubt about the credibility of this statement, take a walk through the library the night before exams start. University students thrive on cramming the night before an exam or assignment is due. Rather than being fueled by energy, students tend to be fueled by a lack of sleep, stress, and caffeine. Unfortunately, this leads to more stress, which in turn causes more procrastination – it appears to be a vicious cycle. Life is all about meeting deadlines, personal commitments and multi-tasking. In order to successfully complete these tasks, individuals must exercise stress management and time management. Therefore, this line of research is important because it helps to shed light on concepts that undoubtedly affect every individual at one time or another. Further research will lead to an understanding of the relationship between procrastination and stress. Eventually, preventive measures will be developed to aid in the avoidance of getting caught up in the vicious cycle. The effects of procrastination and stress are evident in the workplace, universities worldwide, and
society in general. For this reason, research is necessary so that a greater understanding can be achieved.
Appendix A

Instructions for the Low Effort - High Stress Condition

Here are your instructions:

You have to write a 1 paragraph essay on a topic of your choice. You can do it whenever you want. You have 3 days to complete it (so you would have to email it to me by - insert time and date). Regardless of whether you finish the essay or not, you must email me something by (insert time) on (insert date).

You must also write down the time that you finished the essay because you may finish it days before you email it to me!

Please do no speak to your friends about any of the instructions that I have given you because their instructions may be different. Also, it is crucial that you don’t talk about the task with them because if they participate and you guys talk about it, they will be reminded and the results will be affected!

After you submit your essay to me, I will send you a debriefing form that will tell you a little more about the study.

Let me know if you have any questions or concerns and thank you so much for your help, I really appreciate it!
Appendix B
Instructions for the Low Effort - Low Stress Condition

Here are your instructions:

You have to write a 1 paragraph essay on a topic of your choice. You can do it whenever you want. You have 7 days to complete it (so you would have to email it to me by - insert time and date). Regardless of whether you finish the essay or not, you must email me something by (insert time) on (insert date).

You must also write down the time that you finished the essay because you may finish it days before you email it to me!

Please do no speak to your friends about any of the instructions that I have given you because their instructions may be different. Also, it is crucial that you don’t talk about the task with them because if they participate and you guys talk about it, they will be reminded and the results will be affected!

After you submit your essay to me, I will send you a debriefing form that will tell you a little more about the study.

Let me know if you have any questions or concerns and thank you so much for your help, I really appreciate it!
Appendix C

Instructions for the High Effort - High Stress Condition

Here are your instructions:

You have to write a 1-2 page essay on a topic of your choice. You can do it whenever you want. You have 3 days to complete it (so you would have to email it to me by - insert time and date). Regardless of whether you finish the essay or not, you must email me something by (insert time) on (insert date).

You must also write down the time that you finished the essay because you may finish it days before you email it to me!

Please do no speak to your friends about any of the instructions that I have given you because their instructions may be different. Also, it is crucial that you don’t talk about the task with them because if they participate and you guys talk about it, they will be reminded and the results will be affected!

After you submit your essay to me, I will send you a debriefing form that will tell you a little more about the study.

Let me know if you have any questions or concerns and thank you so much for your help, I really appreciate it!
Appendix D
Instructions for the High Effort - Low Stress Condition

Here are your instructions:

You have to write a 1-2 page essay on a topic of your choice. You can do it whenever you want. You have 7 days to complete it (so you would have to email it to me by - insert time and date). Regardless of whether you finish the essay or not, you must email me something by (insert time) on (insert date).

You must also write down the time that you finished the essay because you may finish it days before you email it to me!

Please do no speak to your friends about any of the instructions that I have given you because their instructions may be different. Also, it is crucial that you don’t talk about the task with them because if they participate and you guys talk about it, they will be reminded and the results will be affected!

After you submit your essay to me, I will send you a debriefing form that will tell you a little more about the study.

Let me know if you have any questions or concerns and thank you so much for your help, I really appreciate it!
Appendix E

Analysis of Variance for Effort and Stress

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* p < .05
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References


