

Research Plan

A. **Rationale:** Academic stress is known to cause various psychological problems such as depression and anxiety. These stress-related disorders have a large impact on students' academic results and tend to negatively impact individual development. Students' have different ways of interpreting problems; while some students easily respond to difficult scenarios, others lack certain skills required to succeed. Russian psychologist Lev Semenovich Vygotsky theorized the zone of proximal development where he states that children have limited academic capabilities before they require assistance from their peers, that students' have limits preventing them from successfully completing a task. In this experiment, students' will be asked to complete a task that is determinant of their attention capacity and ability to focus. They will be tested two different times, December and January; in what is assumed to be a non-stressful time, and stressful time. While it is theorized that students' have a certain limit to their knowledge, this experiment will allow the researcher to verify whether this limit is directly impacted by academic stress.

B. Research Questions/ Hypothesis/ Expected Outcomes:

○ Research Questions:

- i. Does a stressful school environment affect students' attention capacity and processing ability?
- ii. Will there be different academic stress levels/stroop performance between genders?
- iii. Does workload and homework time affect academic stress level and stroop score?

- **Hypothesis:** Students' with a performance score of 16 or higher on the survey will take longer to complete the Stroop Test than students who show a low stress level.
- **Expected Outcomes:**
 - i. Females would show better stroop scores than males.
 - ii. Students with a high academic stress level would show weak performance on the stroop task.
 - iii. January stress levels and stroop scores would be higher than stress levels and stroop scores in December.

C. Procedure and Materials/ Risk and Safety/ Data Analysis

- **Procedure:**
 - i. Students will be approached before and after school during non-academic periods to participate in a voluntary research project designed to learn more about the relationship between academic vigor and cognitive processing. Cooperating students will be given a numbered consent form to be signed by a guardian.
 - ii. Only students with signed consent forms will complete a Microsoft Forms containing questions that measure academic stress based on Sheldon Cohen's perceived stress scale.
 - iii. After completing the consent form , each participant will individually complete an online Stroop Effect activity in my advisors classroom after school without the student researcher present, in order to maintain

confidentiality. (Students will be directed to download stroop task app on phones before taking stress survey.)

- iv. Students will repeat the online survey and stroop task in my advisor's classroom during the second week of January.

- **Materials:**

- i. Encephalapp (online free cellular application with stroop task)
- ii. Consent Forms
- iii. Microsoft Forms academic stress survey
- iv. At least 200 participants

- **Data List:** Questions on the consent form will record an individuals' academic stress, gender, and grade, and the Stroop Effect Activity will have separate data containing how long the student took to complete the task.

- **Risk Assessment:** Students ages 15 - 18 will be participating in this study. Since these students are minors, they will be required to get a parental signature before being given the survey and completing the stroop task. Random students will be asked to participate voluntarily after school and during non academic periods at Valley Stream Central High School. Those who cooperate will be given a parental consent form through the teacher. Once the consent form is completed, students will be shared a link containing a survey using the Microsoft Forms and then individually complete the Stroop Task in my advisor's classroom after school. The survey is expected to be completed in at least two minutes whereas the timings for the Stroop Effect is expected to have a larger range, on average 3-5 minutes. The Stroop Test will be

completed on an app, available to both android and iOS users, that students will be instructed to download before taking the survey. Results will be submitted to a password protected email address that only my advisor will have access to; data made only identifiable by subject number will then be sent to the researcher. The survey would be considered minimal risk as students will not be questioned about personal experiences nor physiological well being.

In order to protect the privacy of the participant, I will deidentify the subjects by assigning them a number that is given on the consent forms. Each student will input this number on the first question of the survey in order to match the consent forms with the survey. The results will then be sent to the researcher made only identifiable by subject number. The student researcher will not be present in the room while the survey and stroop simulation are completed. Data will be stored on a Microsoft Excel sheet using a password encrypted file until the data analysis is complete. After the data analysis is complete, the data will be deleted. As the experiment involves collecting data from the same participant on multiple occurrences, the data and survey will be labeled with a participant number and a list of names. Participant numbers will be stored on a password protected computer. Once the second round of data is collected, the surveys/data will be matched using the participant number. Consent forms will be kept in a secure location separate from the data. The student researcher will not have access to signed consent forms.

There is low risk of threats to confidentiality as the number of participants will be relatively large and each student questioned individually. Data will not be shared with any other participant.

- **Data Analysis:** Data will be analyzed through JASP software and Microsoft Excel. T-Tests between stress levels and stroop performance in December and January will be conducted as well as a correlation matrix for December stress levels and stroop scores and January stress levels and stroop scores in order to determine any significant difference between the mean values for all variables as well as an r-value to determine the strength of the relationship between both variables. T-Tests on stress levels and stroop scores between gender and grade will also be conducted to find any significance between mean values for all variables. An ANOVA will be conducted between different stress levels to find any significant difference between the mean values of all stress levels within groups of workload and homework times.

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NO ADENDUMS EXIST