# Effect of mild stress on memory retention

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## Abstract

Numerous studies have shown the effects of how stress impacts memory, especially in clinical setting. However, less is known about how minor changes in stress can influence learning and memory. The current study looked at how self-report measures of stress can influence learning behavior. The current study used 55 participants from the General Psychology class at Carroll College. There was no significant difference between the total number of correct responses on factual questions between low stress and moderate to high stress. There was also no significant difference between the total number of correct responses on conceptual questions between low stress and moderate to high stress. The following study failed to show that mild stress effects conceptual or factual memory retention.

## Background

- One study evaluated learning performance by having participants take notes while watching an informational video (Mueller & Oppenheimer, 2014). Students taking longhand notes were able to retrieve more information than students who took notes on their laptop. The current study used the same stimuli from Mueller and Oppenheimer (2014) to evaluate how factual and conceptual memory may be impacted by stress.
- Merz, Dietsch, and Schneider (2016) conducted a study to examine whether stress plays a factor in the retrieval of specific concept knowledge and found that acute psychological stress can affect conceptual information retrieval.
- Especially in the classroom, stress can have a negative effect on learning and memory retrieval (Vogel & Schwabe, 2016). Multiple memory systems can be used to encode memories and stress effects which of the memory systems are used (Vogel & Schwabe, 2016).

## Goals

- Examine each participant's stress score on the Depression, Anxiety, and Stress Scale (DASS) and the number of factual and conceptual questions answered correctly.
- Evaluate if there is a correlation between level of stress and number of correct questions.
- **Hypothesis**: If an individual has higher stress levels of the DASS, they will then score lower on the factual and conceptual questions.



Conceptual Questions



Factual Questions

| Predictor Variable | Beta | p |
|---|---|---|
| Depression | 0.322 | p=0.14 |
| Anxiety | 0.010 | p=0.966 |
| Stress | -0.094 | p=0.697 |

## Methods

**Participants**
- 55 Carroll College students

**Measurements**
- Depression, Anxiety, and Stress Scale (DASS)
- Conceptual and factual questions developed by Mueller and Oppenheimer (2014)

**Procedure**
- Participants watched the Ted Talk: *How Algorithms Shape Our World* and took longhand notes on notebook paper
- After the ted talk the DASS was filled out, and immediately after the questionnaire about the Ted Talk developed by Mueller and Oppenheimer (2014) was completed
- Depression, anxiety, and stress scores on the DASS were compared to how well each participant did on the Ted Talk questionnaire
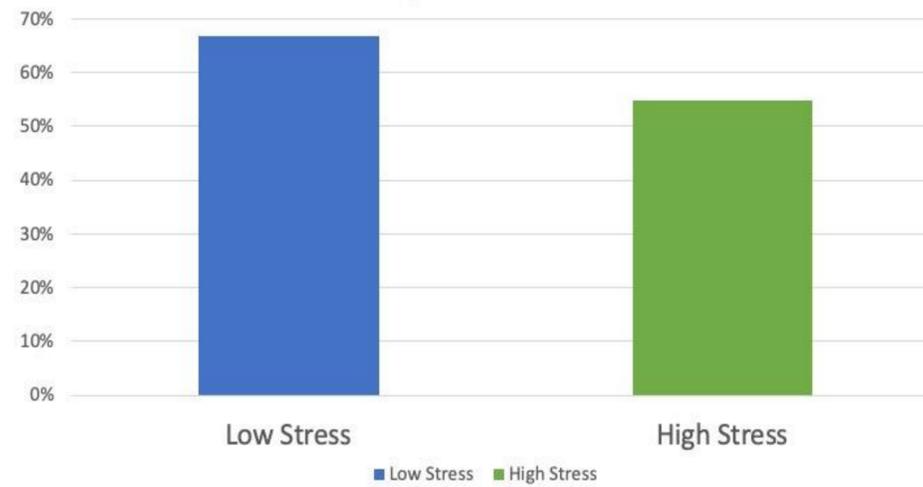
## Results

- The overall percent correct scores were entered into a multiple regression analysis (enter method). There was no significant model ($F_{(3,52)} = 1.325$, $p=0.276$)
- Number of correct scores on factual and conceptual questions were analyzed using a between subjects ANOVA that compared normal to mild stress (N=42) and moderate to severe stress (N=14)
- There was no significant difference between the total number of correct responses on factual questions between low stress and severe stress ($F_{(1,55)} = 0$, $p=1$). There was also no significant difference between the total number of correct responses on conceptual questions between low stress and severe stress ($F_{(1,55)} = 1.844$, $p=0.180$)
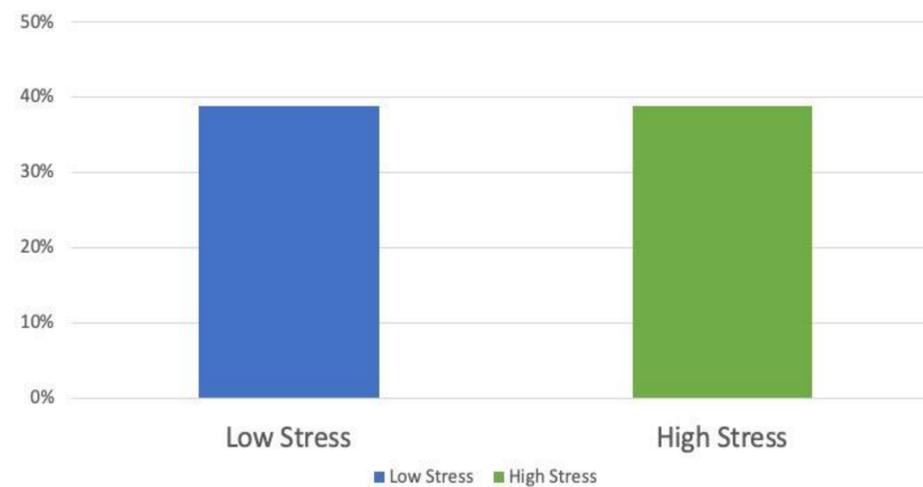
## Conclusions

Stress did not have a significant effect on how well a participant scored on conceptual or factual questions.

- Unlike Merz, Dietsch, and Schneider (2016), our study may not have found results because we did not induce stress on our participants as they did. The majority of our patients were not severely stressed, unlike Merz, Dietsch, and Schneider (2016).
- Our results may not have been consistent with Vogel and Schwabe (2016) because the material used was an not authentic classroom or related to the class the students were receiving credit for.
- Vogel and Schwabe (2016) also mentioned classrooms can be full of emotional information that provokes stress, and the current study actively tried to use plain information.