



# Effects of Academic Stress on Cognitive Ability & Working Memory

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## Introduction

- Numerous studies have shown academic stress can negatively impact academic performance and health
- We are comparing the performance on the digits-backwards and Stroop tasks—cognitive tasks designed to assess working memory—on a day students have their hardest exams and on week they do not
- If stress were to negatively affect cognition, we anticipate students would perform worse on tasks on the exam day

## Methods

- Stroop Task: participants read columns of (1) words, (2) colored Xs, and (3) colored words (Figure 2) aloud as fast and accurately as possible, for a maximum of 100 correct words or colors from each of the 3 lists
- Digits Backwards Task: participants must recite successively longer lists of numbers backwards, for a maximum of 14 correct lists (Figure 1)
- Statistical Analysis: t-test between performance on baseline (no exam) and stress (exam day) conditions for all of the tasks

## Data & Analyses

Digits Backwards Task

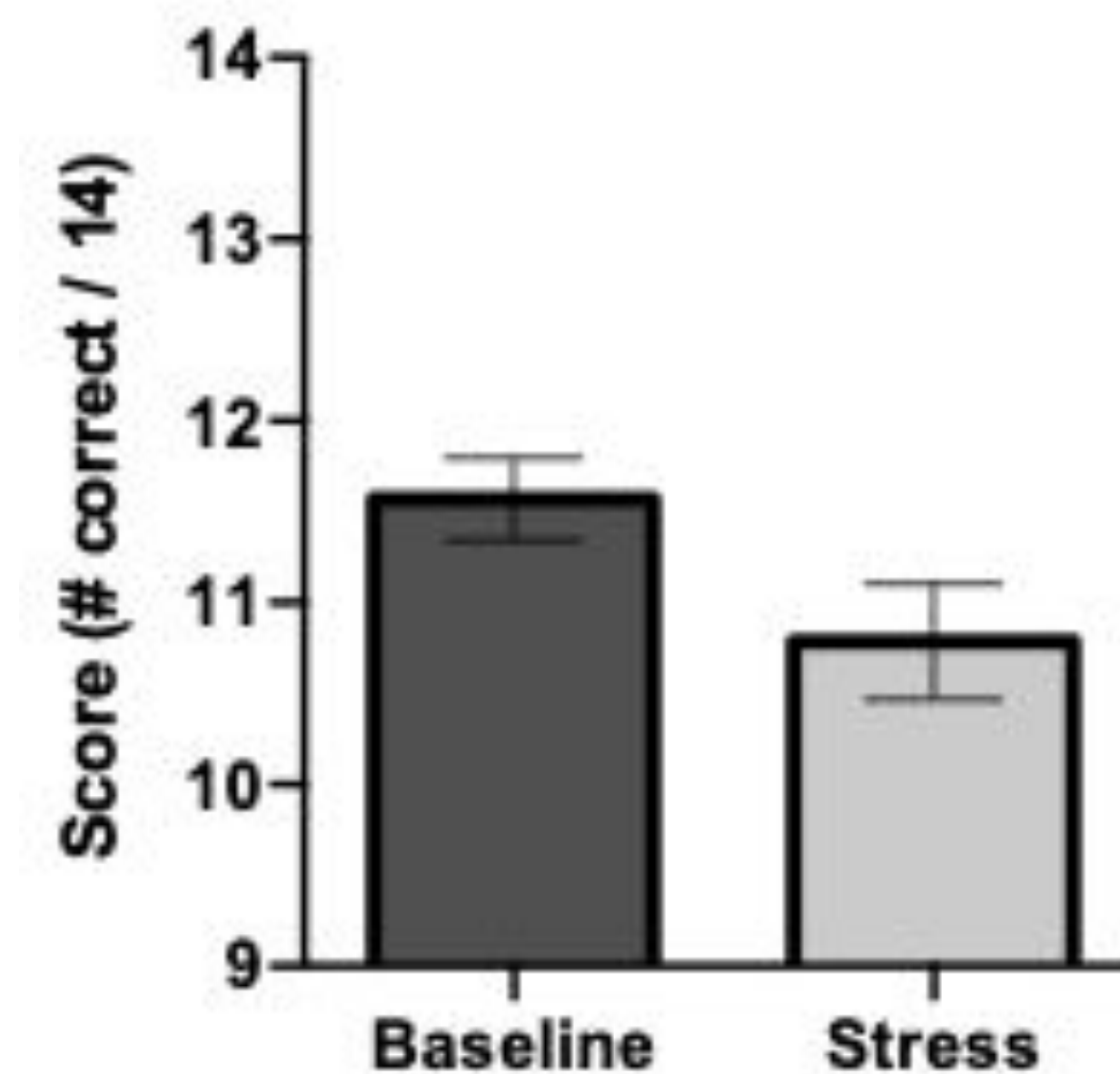


Figure 1. No significant difference between baseline and exam-day stress conditions ( $t(26)=2.011$ ,  $P=0.0548$ )

Stroop Task (Naming Colors of Words)

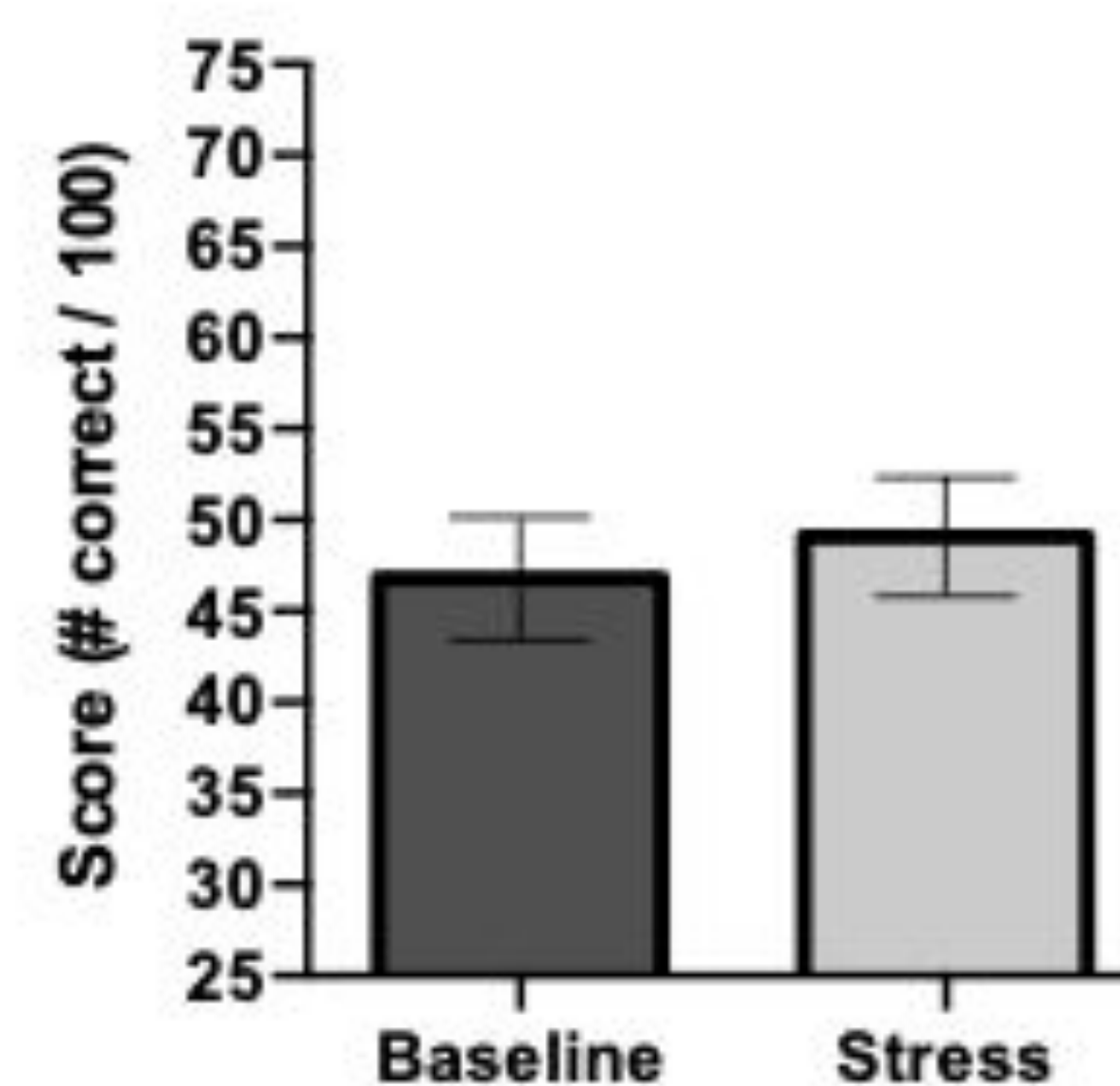


Figure 2. No significant difference between baseline and exam-day stress conditions ( $t(26)=0.4853$ ,  $P=0.6315$ )

## References

- Shanker, N. L. & Park, C. L. Effects of stress on students' physical and mental health and academic success. *Int. J. Sch. Educ. Psychol.* **4**, 5-9 (2016)
- Henderson, R. K., Synder, H. R., Gupta, T. & Banich, M. T. When does stress help or harm? The effects of stress controllability and subjective stress response on stroop performance. *Front. Psychol.* **3**, 179 (2012)

## Discussion

- Preliminary analysis suggests that exam stress does not alter working memory
- Found no significant difference between the baseline and stress conditions for either of the tasks
- This is an ongoing study—null findings could be due to a small sample size ( $n=14$ )
- We anticipate that a greater sample size will potentiate the relationship between working memory and academic stress
- At the conclusion of the study, we expect to find on the day of a stressful exam students will perform worse on the tasks

## Limitations

- Primarily the small sample size ( $n=14$ )
- Other limitations:
  - Order effects; was the baseline exposure to cognitive tasks the first or second exposure (i.e. does everyone improve their second time)
  - Confounding variables; did other stressors (academic, life) interfere with baseline measures, etc.
  - Human error; differences in time allocated and/or manner presented to participants for tasks