

## INTRODUCTION

- Post secondary education can be a source of much stress for students (MacGeorge, Samter & Gillihan, 2005).
- Chronic stress is known to cause mental health issues (Arthur 1998) and physical illness (Torsheim & Wold, 2001).
- Lack of time to accomplish tasks is one of the most-cited sources of stress for post-secondary students (El-Ghoroury, Galper, Sawaqdeh & Bufka, 2012).
- Many stress-coping methods, like meditation and consistent exercise, are effective for coping with stress; however, these methods require time to implement, time students often do not believe they have (El-Ghoroury, Galper, Sawaqdeh & Bufka, 2012).
- During acute stress, deep breathing (Cheng, Croarkin, & Lee, 2019) and cognitive reappraisal (Jamieson, Mendes & Nock, 2013) can decrease both physiological and psychological stress responses. These stress coping methods are quick to use and work almost instantly.
- **Deep breathing** reduces stress as it lowers heart rate and blood pressure by activating the parasympathetic nervous system (Kim, Bae & Bae, 2018).
- **Cognitive reappraisal** reduces stress by changing the way people think about their stress response from debilitating to energizing and enhancing (Jamieson, Mendes & Nock, 2013).
- Although these immediate, non-time-consuming stress coping methods exist, students still report large amounts of academic-related stress (Elias, Ping & Abdullah, 2011).
- It is uncertain whether students:
  - a. Do not know about these quick-use coping methods
  - b. Do not believe they are effective, or
  - c. Do not use these coping methods for some other reason
- By providing **information** about these interventions and connecting them with **biofeedback** measures of **heart rate** and **blood pressure**, we aim to show students that they are effective for reducing stress.
- We hope this evidence of intervention efficacy will prompt students to use the techniques during future acute stressors, such as high-stakes exams.

### Research Questions:

1. Does cognitive reappraisal (a cognitive intervention) reduce heart rate and blood pressure as much as deep breathing (a physical intervention)?
2. Does providing information about cognitive reappraisal and deep breathing prompt students to use those techniques more during moments of acute stress?
3. Does providing information plus biofeedback about cognitive reappraisal and deep breathing prompt students to use those techniques more during moments of acute stress than just providing information?

## METHODS

### 1 PARTICIPANTS WILL BE DIVIDED INTO FIVE GROUPS

#### Control

#### Information only

- Cognitive reappraisal
- Deep breathing

#### Information & biofeedback

- Biofeedback & cognitive reappraisal
- Biofeedback & deep breathing



### 3 FIRST STRESS TASK

- A timed math test will be used to induce stress.

### 5 SECOND STRESS TASK

- A different timed math test will be used to induce stress. Participants will be asked to apply the stress coping intervention they learned during the math test.



### 2 PARTICIPANTS WILL COMPLETE BASELINE STRESS MEASURES

#### Information only

- Perceived Stress Scale
- Stress Mindset Measure



#### Information & biofeedback

- Heart rate
- Blood pressure
- Perceived Stress Scale
- Stress Mindset Measure

### 4 INTRODUCTION OF STRESS INTERVENTION

Participants in the Information & biofeedback group will observe the changes in their physiological stress response via heart rate and blood pressure measures. Participants in the Control and Information only groups will sit quietly after the math test for a few minutes.

#### Deep breathing

- The participants will learn diaphragmatic breathing

#### Cognitive reappraisal

- The participants will learn to think of their stress response as performance enhancing

### 6 INTERVENTION UTILIZATION MEASURE

- Weekly follow-up emails will be sent to participants to assess how often the intervention was used during times of acute stress, like exams, and whether the intervention was deemed effective.



## EXPECTED RESULTS

1. Cognitive reappraisal will reduce heart rate and blood pressure as much as deep breathing.
2. Participants in the Information only groups will use the coping intervention they learned more throughout the semester than participants in the Control group.
3. Participants in the Information & biofeedback groups will use the coping intervention they learned more throughout the semester than both participants in the Control group and in the Information only groups.

## DISCUSSION

Biofeedback can offer students a fast way to confirm that the stress coping method they use is effective at decreasing the physiological symptoms of stress, which will lower the risk of stress-related diseases later in life. When a student finds a stress intervention effective and uses it regularly, it can improve their overall well-being, increase their confidence in their ability to cope with stress, and boost academic performance (MacGeorge, Samter & Gillihan, 2005).

## REFERENCES

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