# The Association Between Emotions, Working Memory, and Executive Functioning in an Undergraduate Population

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## Introduction

- Depression, anxiety, and stress are among the most common mental health problems faced by university students and are linked to poorer academic performance
- This link may be due to the effects of depression, anxiety, and stress on cognition, especially impairments in working memory and executive functioning (EF)
- Most previous research with undergraduate students has focused only on diagnosed mental health conditions, failing to take into account subclinical levels of depression, anxiety, and stress

**RESEARCH QUESTION:** Are self-reported symptoms of depression, anxiety, and stress associated with impairments in working memory and EF among university students?

## Methods

Questionnaires:

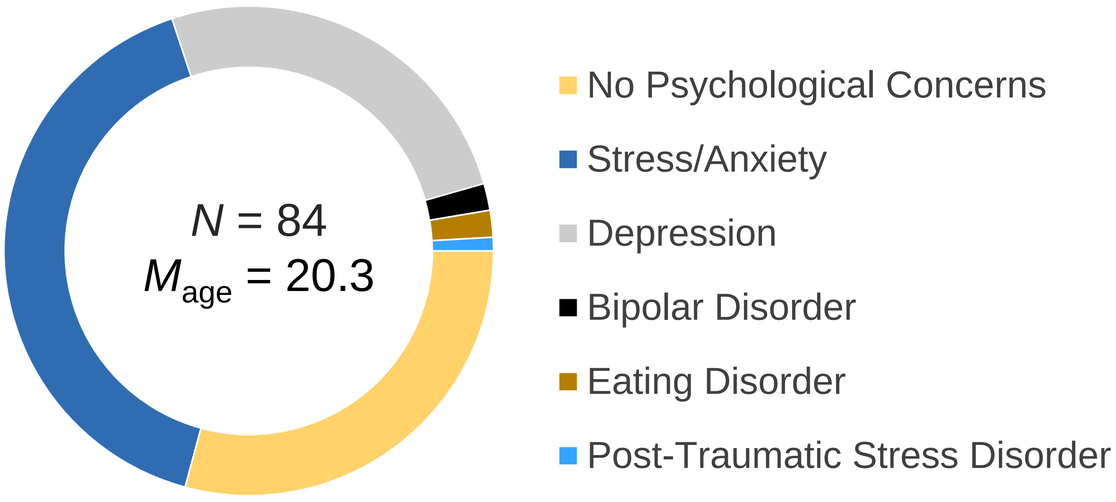
- **Depression, Anxiety, and Stress Scale (DASS):** A 21-item questionnaire assessing symptoms of depression, anxiety, and stress
- **Behavior Rating Inventory of Executive Function (BRIEF):** Measures EF and yields 3 composite scores: General Executive Composite (GEC), Metacognition Index (MCI), and Behavioral Regulation Index (BRI)

Cognitive Tests:

- **Finger Windows from the WRAML-2***:* visual working memory
- **Sentence Memory from the WRAML-2***:* verbal working memory
- **Wechsler Test of Adult Memory (WTAR):** estimates Full-Scale IQ (FSIQ)

## Results

Self-Reported Psychological Characteristics of the Sample




Regression Models Predicting Working Memory

| Dependent Variable | *β* | *t* |
|---|---|---|
| Verbal Working Memory | | |
| Depression | –0.002 | –0.01 |
| **Anxiety** | **–0.455** | **–2.82**** |
| Stress | 0.235 | 1.44 |
| Visual Working Memory | | |
| Depression | 0.058 | 0.34 |
| Anxiety | –0.139 | –0.83 |
| Stress | –0.186 | –1.11 |

Regression Models Predicting BRIEF-A

| Dependent Variable | *β* | *t* |
|---|---|---|
| BRIEF-GEC | | |
| *Block 1* | | |
| **FSIQ** | **0.276** | **2.599*** |
| *Block 2* | | |
| Depression | –0.163 | –1.018 |
| Anxiety | 0.15 | 0.989 |
| **Stress** | **0.405** | **2.663**** |
| BRIEF-BRI | | |
| *Block 1* | | |
| **FSIQ** | **0.331** | **3.179*** |
| *Block 2* | | |
| Depression | 0.102 | 0.77 |
| Anxiety | 0.215 | 1.706 |
| **Stress** | **0.37** | **2.922*** |
| BRIEF-MCI | | |
| *Block 1* | | |
| **FSIQ** | **0.43** | **2.269*** |
| *Block 2* | | |
| Depression | –0.059 | –0.348 |
| Anxiety | 0.149 | 0.933 |
| Stress | 0.232 | 1.442 |

## Conclusions

- Consistent with previous research, anxiety predicted impairments in verbal working memory, even when including those with subclinical levels
- Contrary to previous research, mental health status did not predict visuospatial working memory
- In line with previous research, the present study found that stress predicts executive dysfunction as measured by the BRIEF-A. This likely relates to the often observed association between stress and poor academic performance

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