Is stress ruining your life?
The effects of acute stress on the neural correlates of decision-making

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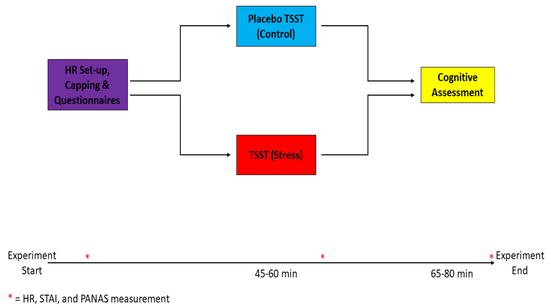
INTRODUCTION

- Stress occurs when the demands of the situation threaten homeostasis or resources are perceived to be inadequate to meet the challenge[1-4].
- Stress affects underlying processes involved in decision-making: learning from rewards, and attentional processing.
- **Purpose:** Use EEG to investigate the effects of acute stress on decision-making through the examination of the neural correlates of reward processing and context updating.

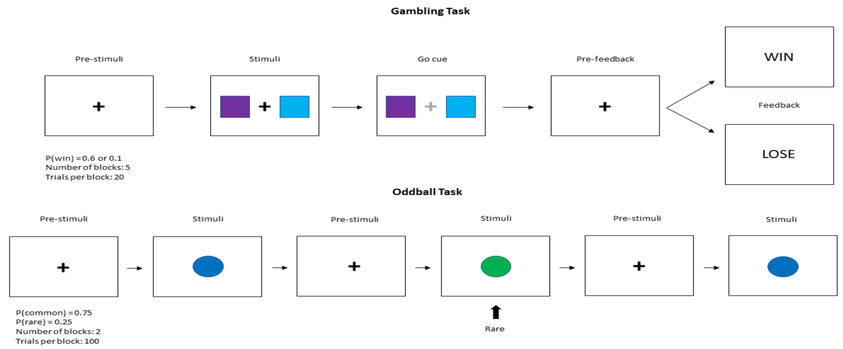
METHODS

PROCEDURE

- *n* = 26
- STAI questionnaires and heart rate were recorded for manipulation checks
- Trier Social Stress Test (gold standard for inducing acute stress) was used to induce acute stress
- EEG was recorded post-TSST (stress condition) or post-Placebo TSST (control condition)



COGNITIVE ASSESSMENT TASKS



RESULTS

Heart Rate

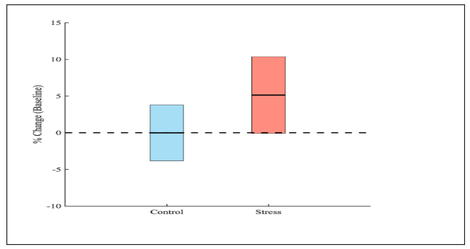


Figure 1. Mean heart rate % change from baseline during the TSST comparing control and stress conditions. Error bars indicate 95% confidence intervals.

STAI Questionnaires

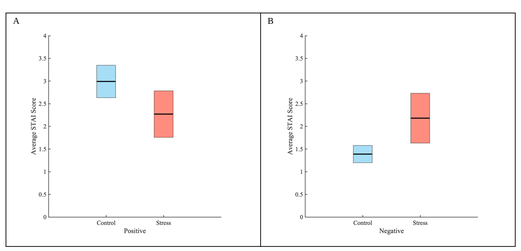


Figure 2. Mean STAI score post-TSST for positive (A) and negative (B) affect scores for control and stress conditions. Error bars indicate 95% confidence intervals.

Gambling Task

Oddball Task

Control Condition

Stress Condition

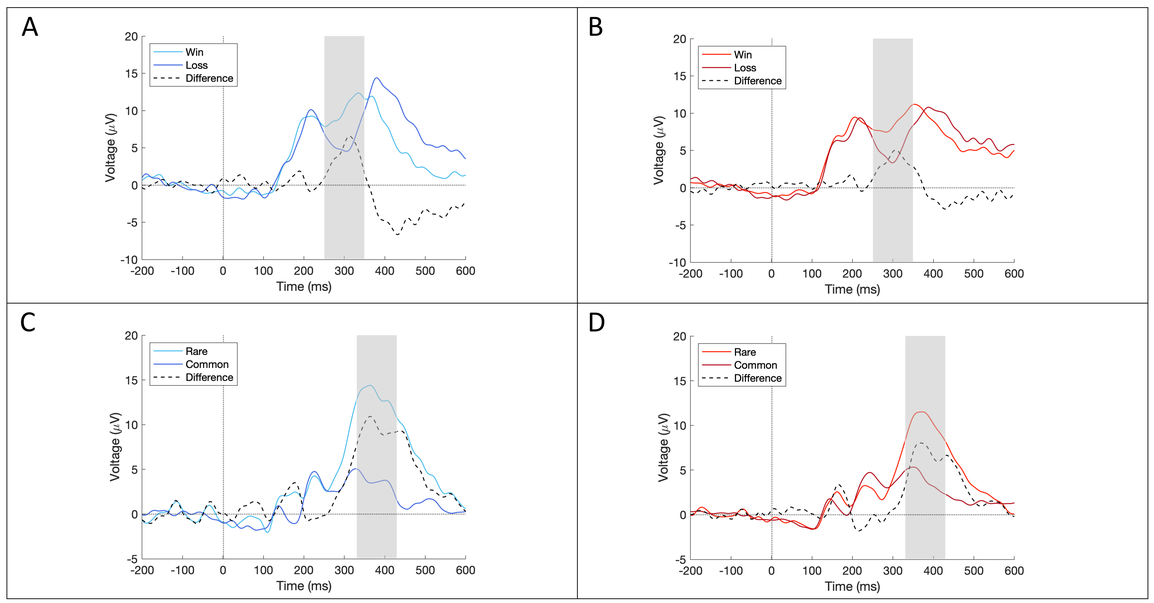


Figure 3. ERP components for the gambling task comparing the mean win and loss feedback for the control (A) and stress (B) conditions, and ERP components for the oddball task comparing the mean common and rare (oddball) trials for the control (C) and stress (D) conditions .

CONCLUSIONS

- Measures of heart rate and anxiety (STAI) were affected, demonstrating that the TSST increased physiological and psychological stress.
- The reward positivity component did not significantly vary between control and stress conditions for the gambling task.
- The P300 component showed the trend of decreased amplitude in the stress condition for the oddball task, suggesting decreased context sensitivity.
- Understanding how stress affects executive function, particularly decision-making, is critical for daily living and in the long-term.

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