# REPEATED BOUTS OF HIGH INTENSITY SPRINTS IMPACT ACCURACY ON A WORKING MEMORY TASK IN ARMY ROTC CADETS.

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## Introduction

- Military operations require soldiers to perform complex tasks in high-pressure situations.
- Research shows that cognitive resources deplete as a function of both external and internal stress.
- High-intensity functional training could provide stress stabilizing benefits, which could mitigate cognitive decrements while performing strenuous physical tasks.
- Acute exposures to high intensity physical stress have had varying effects on cognitive function in previous research.

## Purpose

To determine the impact of repeated bouts of sprints and bodyweight exercises on the Hit % and false alarm percent (FA%) of a working memory task.

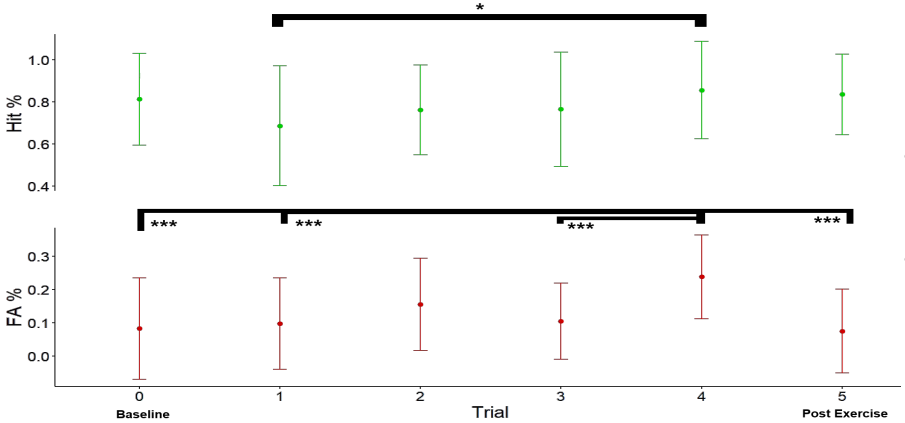
## Methods

- 40 GMU cadets (23.2+/- 4.29 yrs old, 5 Female)
- Phase 1: 2-Back N-back task familiarization baseline
- Phase 2: 4 round workout circuit
- Phase 3: Post exercise at rest 2-Back N-back

## Findings for Application

- Training that increases anaerobic capacity and overall aerobic endurance may mitigate the increase in false alarms while still improving correct hits.
- Combining physical and cognitive training may facilitate better skill transfer to operational tasks.


**Figure 1: Correct Hit and False Alarm Percentages by Trial Number**




## Analysis

- ANCOVA: Hit % ~ sprint time + Choice Reaction TIme (CRT) + trial number
- ANOVA: FA % ~ sprint trial

## Results

- The overall ANCOVA model was statistically significant, (p=0.001).
- Only CRT (p=.008), and time (p=0.048) had significant effects on hit percent.
- Analysis of CRT effect on H% showed that for a 100ms increase in CRT, H% decreases by 0.028 (p= 0.008).
- The FA% ANOVA revealed a significant main effect of time on FA% (p<.001).

## Conclusion

- Time under physical stress may increase hit accuracy but potentially at the cost of increasing FA for a working memory task.
- Mental fatigue may deplete cognitive resources needed to accurately process incoming information thus increasing FA%.

*Acknowledgements: We would like to thank the GMU Army ROTC staff, officers and Cadets*