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The Effects of Crew Rest on Performance in Marine Corps Aviation

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Monterey, California. Naval Postgraduate School

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Objectives

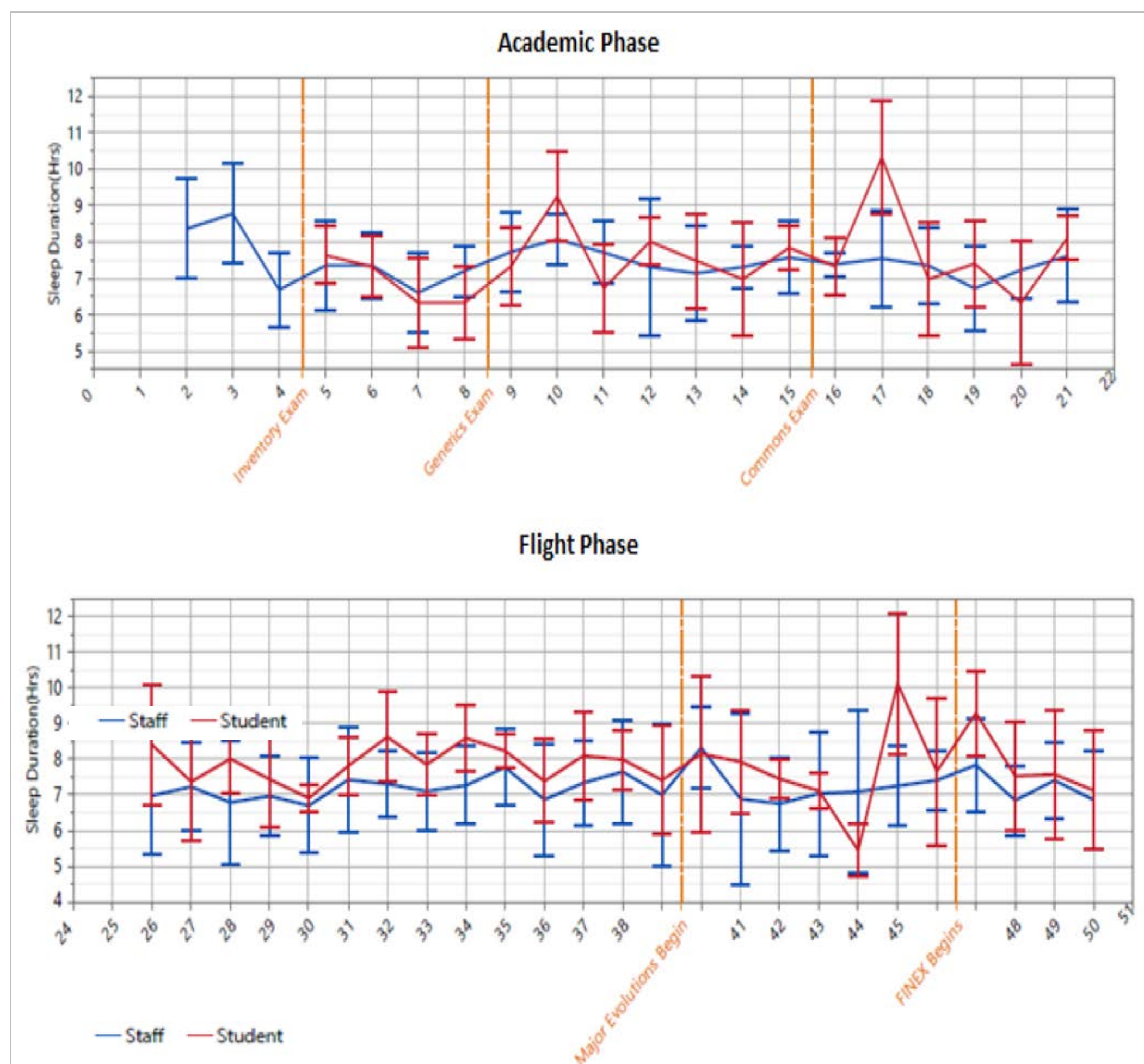
- The Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) leadership wanted to know whether crew rest periods of the instructors and students of Weapons and Tactics Instructor (WTI) course 2-16 were being used for sleep and whether fatigue posed a risk to personnel during the course.
- This work expanded upon prior studies in military educational environments.
- WTI broken up into two different phases:
 - Academic phase
 - Flight phases.

Methods

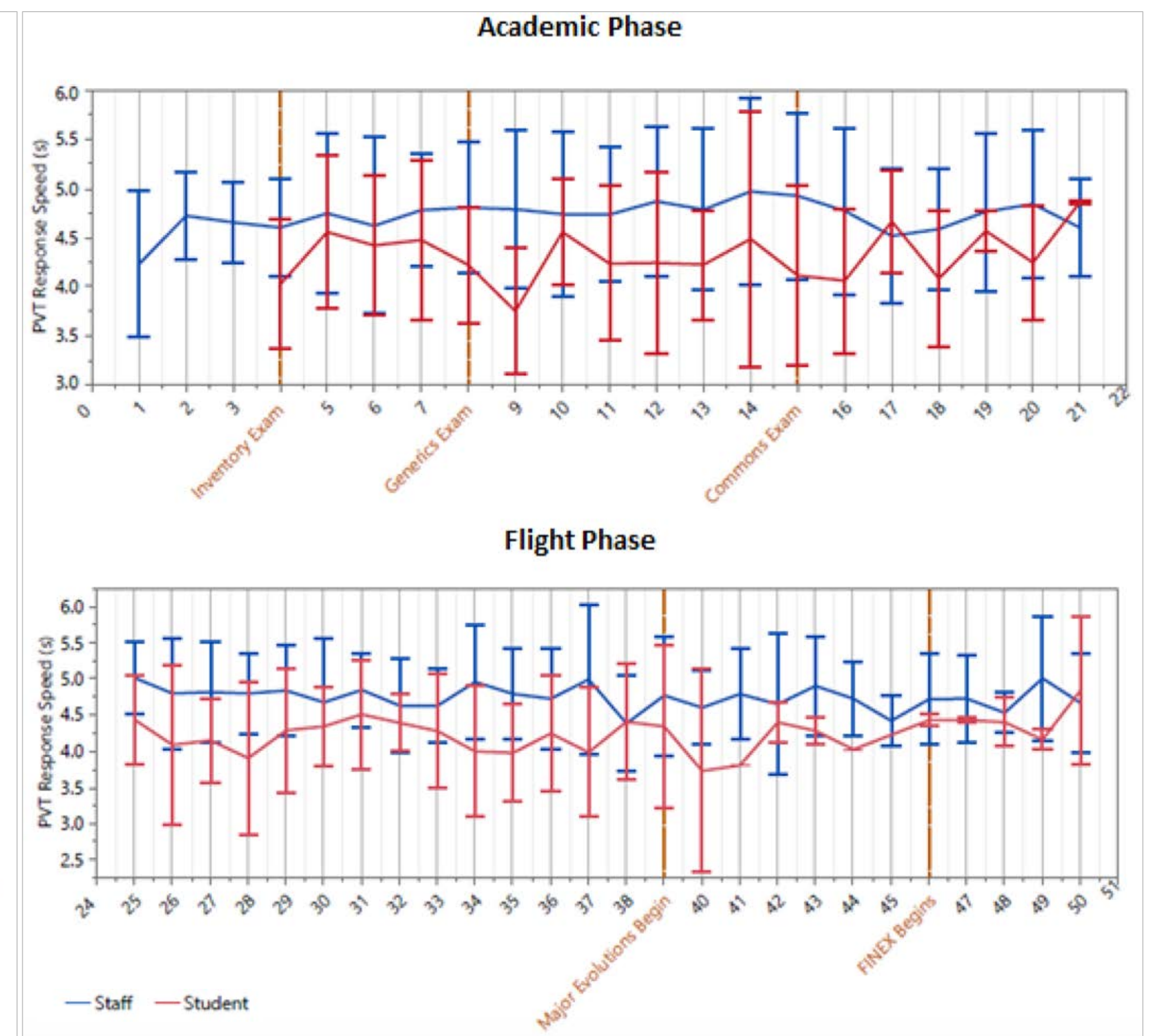
- Sleep was assessed using wrist-worn actigraphs.
- Cognitive performance was assessed with the Psychomotor Vigilance Task (PVT- a reaction time task sensitive to changes in a person's behavioral alertness levels).
- The Profile of Mood States (POMS) used to assess participants' mood.
- The POMS Fatigue sub-score captured participants' fatigue level.

Results

- Both instructors and students appeared to receive adequate sleep of good quality (~7.4 hrs/night).
 - No major differences between the two phases or on a daily basis.
- Staff appear to consistently have faster response speeds and fewer errors than the students.
- There was a significant difference in fatigue scores for participants between the beginning and end of the course, indicating that there was a general increase of fatigue as the WTI course proceeded.



Sleep duration by day for staff and students



Differences in PVT response speed between academic and flight phase

Conclusions

- Sleep duration and efficiency remained high throughout the course, but participation waned before the study ended.
- Comparison with sleep data collected in WTI 2-05 suggested that average sleep duration has remained relatively consistent for the WTI staff and students over the past 10 years.
- There was little variability in the sleep patterns (i.e., WTI participants were abiding by the crew rest regulations). Compliance posed a significant challenge and limited the ability to correlate sleep to performance.
- This work outlined a detailed methodology and lessons learned for follow-on studies of this type and recommended improvements to future studies.

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