CHANGES IN ALERTNESS AND PERFORMANCE OVER TIME DURING LONG-HAUL FLYING ACROSS MULTIPLE TIME ZONES

LUCIA ARSINTESCU MD MA
SAN JOSE STATE UNIVERSITY
FATIGUE COUNTERMEASURES LABORATORY
NASA AMES RESEARCH CENTER

ARSINTESCU L, HILDITCH CJ, KATO KH, GREGORY, KB, & FLYNN-EVANS EE

SJSU NASA

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INTRODUCTION

- Long-haul pilots experience high levels of fatigue and circadian disruptions due to long work hours and flying over multiple time zones

- The aim of this study was to describe changes in alertness and performance among flight crews during long-haul flights crossing multiple time zones

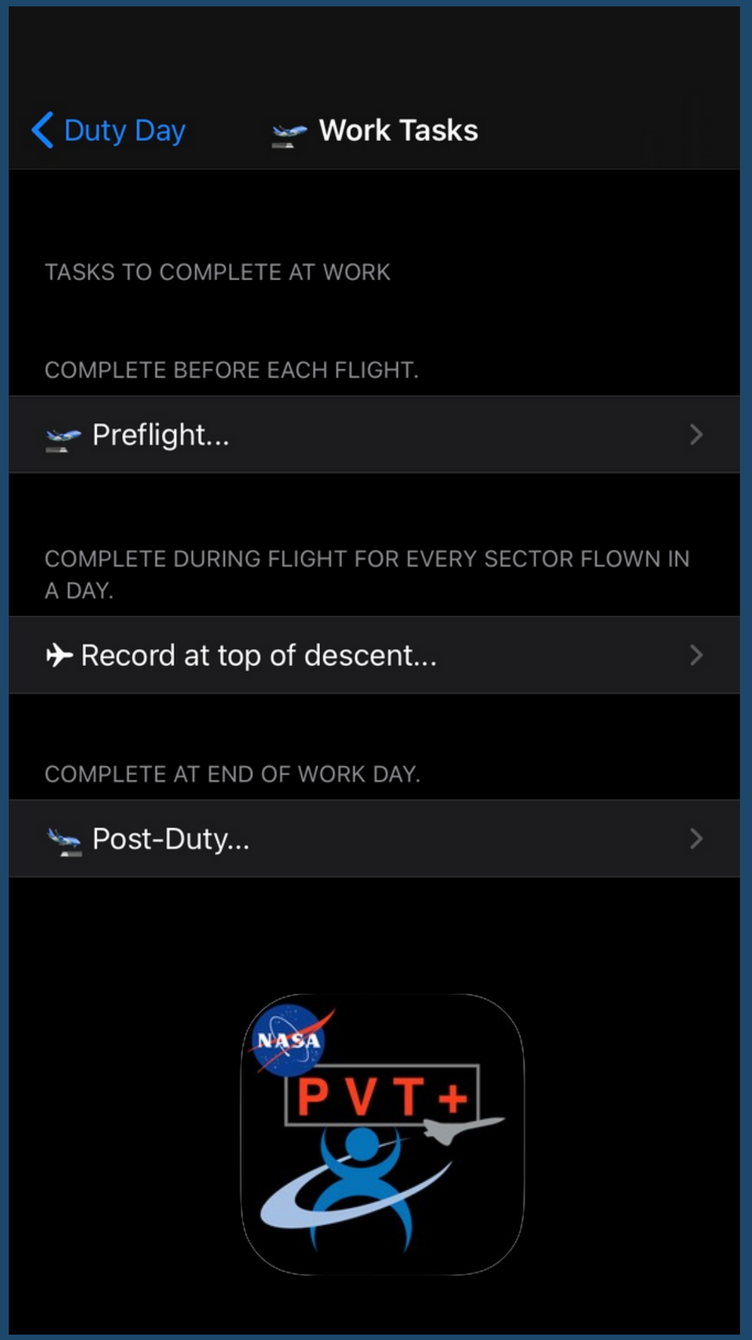
METHODS

- All pilots flying long-haul operations from a single airline were eligible to participate
- All participants collected data for ~2 weeks of their normal work schedule within airline operations, with at least two long-haul rotations, including rest days and layovers
- Each participant was provided with an iPod preloaded with the NASA PVT+ application for completing the study requirements

METHODS

Each participant completed the following data during pre-flight, on top-of-descent (TOD - inflight) and at the end of each flight (post-flight)

- a 5-min Psychomotor Vigilance Task (PVT)
- a Karolinska Sleepiness Scale (KSS)



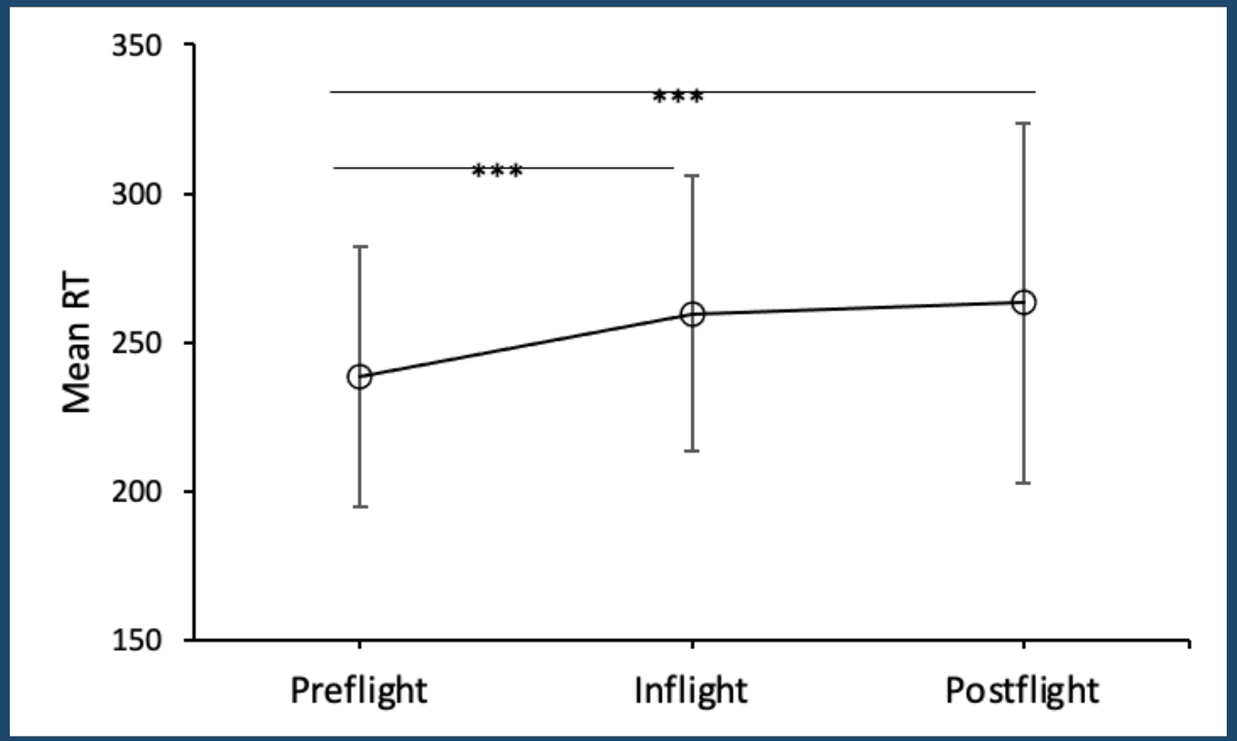
PARTICIPANTS

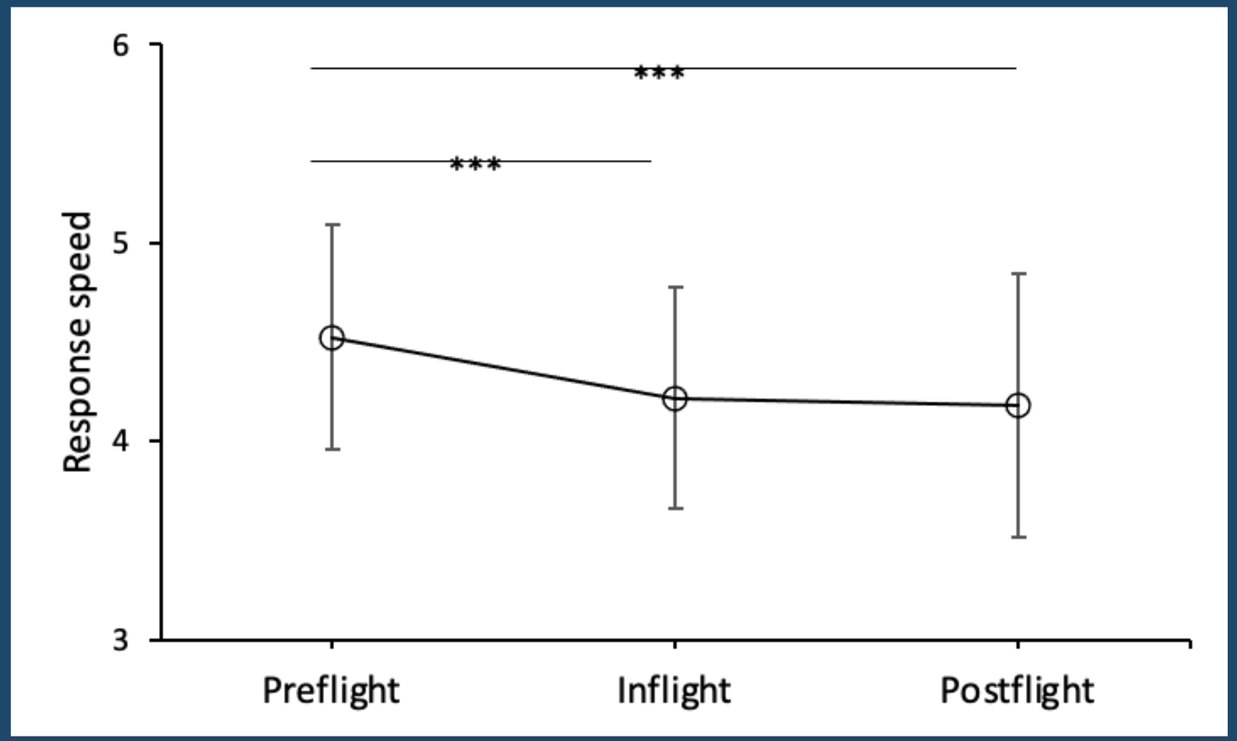
n = 44 (4 females)

	Mean +/- SD
Age	44 (10)
Height (cm)	181.5 (7.7)
Weight (kg)	81.5 (11.3)
BMI (kg/m2)	24.1 (2.5)
Self-reported sleep need (h)	7.7 (0.8)
Most alert time of day	11:05 (03:39)
Most tired time of day	14:09 (07:19)
Total commercial hours	9834.3 (5334.1)
Total hours on type	2833.0 (2141.1)
Total hours with current airline	9235.5 (5028.0)

cm = centimeters; kg = kilograms; BMI = body mass **index; kg/m2 = kilograms per meter squared; h = hours**

RESULTS - PVT

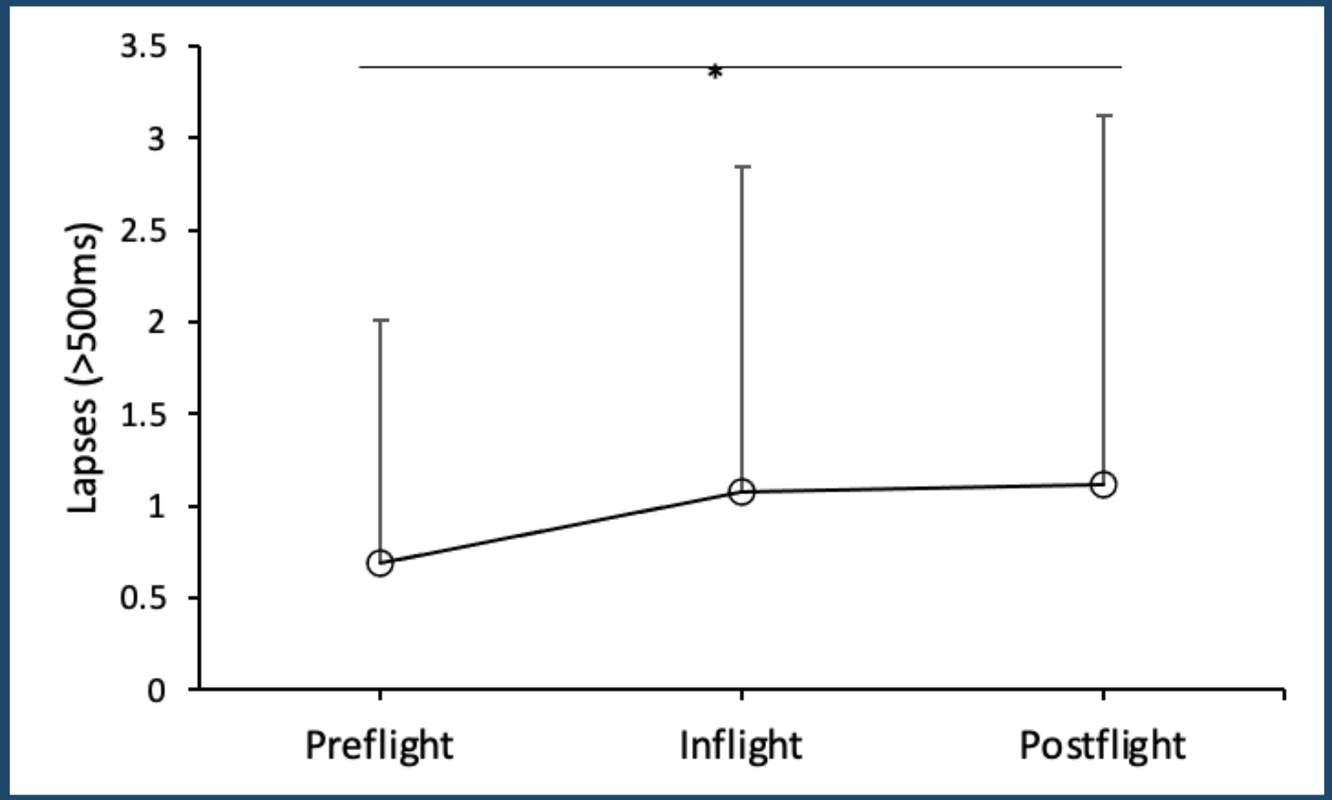




*** $p < 0.001$

- Mean RT (Mean Reaction time): worse performance post-flight and inflight relative to pre-flight
- Response speed (1/RTx1000): slower speed inflight and post-flight relative to pre-flight

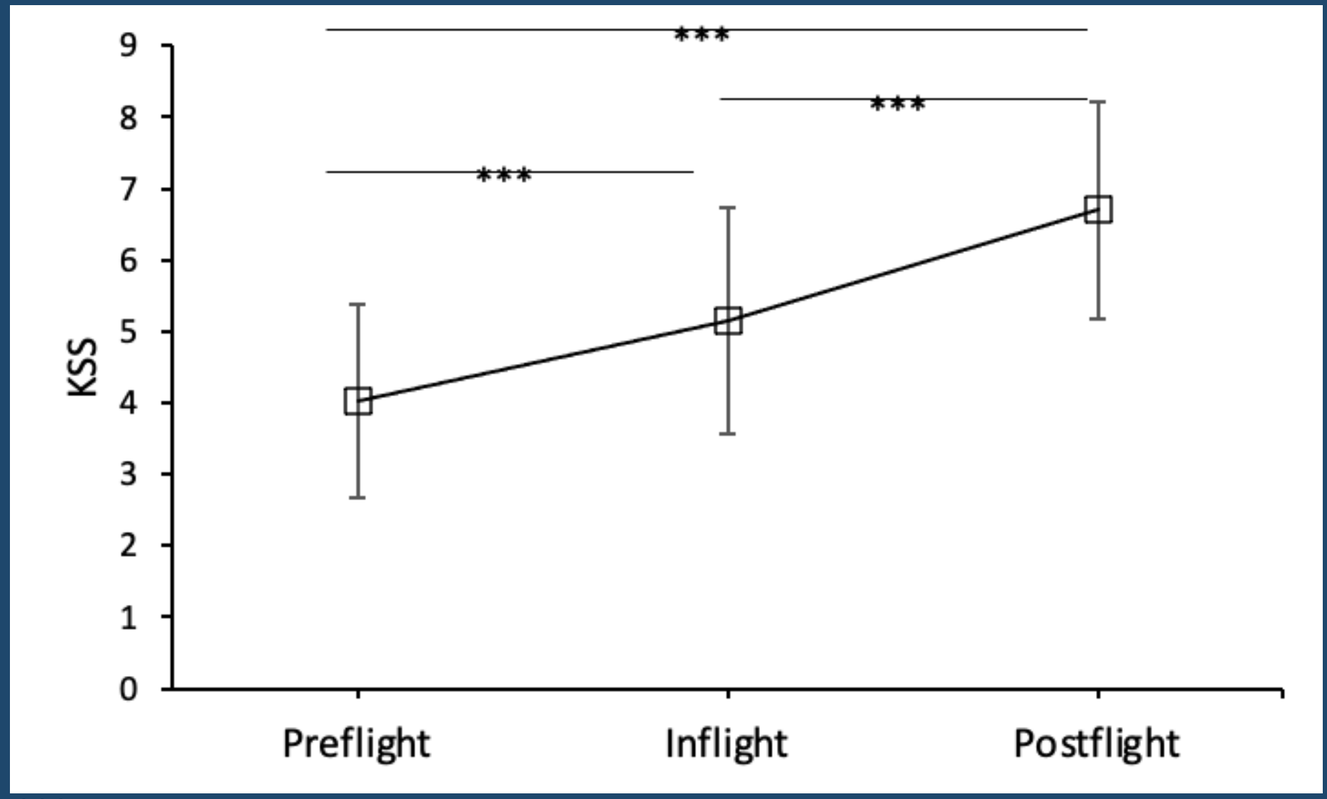
RESULTS - PVT



*$p < 0.05$

- Lapses (RT > 500ms) increased post-flight relative to pre-flight

RESULTS - KSS



***$p < 0.001$

- Participants reported as being more sleepy inflight relative to pre-flight and post-flight relative to inflight and pre-flight

CONCLUSIONS

- Performance as measured by PVT was worse at the end of the flight compared to the beginning of the flight. Participants made more lapses at the end of the flight.

- Participants reported as being sleepier at the end of the flight relative to inflight and begining of the flight.

- We thank to the airline staff and participating pilots

NASA Airspace Operations and Safety Program, System-Wide Safety Project

email:
lucia.arsintescu-1@nasa.gov