

PILOT WORKLOAD IS ASSOCIATED WITH LONG DUTY DAYS AND MULTIPLE FLIGHT LEGS

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ASMA 2021, AUGUST 29-SEPTEMBER 2



Disclosure Information

91st Annual Scientific Meeting

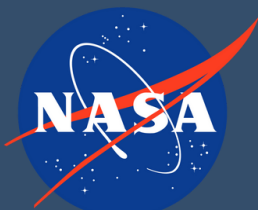
Lucia Arsintescu

I have no financial relationships to disclose.

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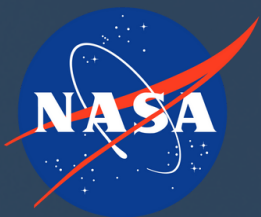


INTRODUCTION

Pilot workload is a real concern throughout aviation.

Workload has not been studied extensively.

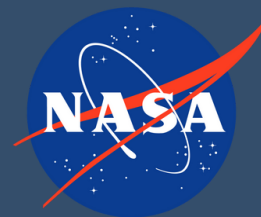
Evaluate workload among short-haul pilots during normal operations.



WHAT IS WORKLOAD?

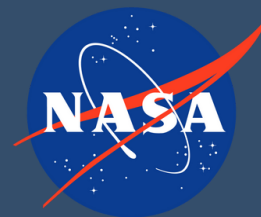


“the interaction between the requirements of a task, the circumstances under which it is performed, and the skills, behaviors, and perceptions of the operator” (Hart and Staveland, 1988);



STUDY PROTOCOL

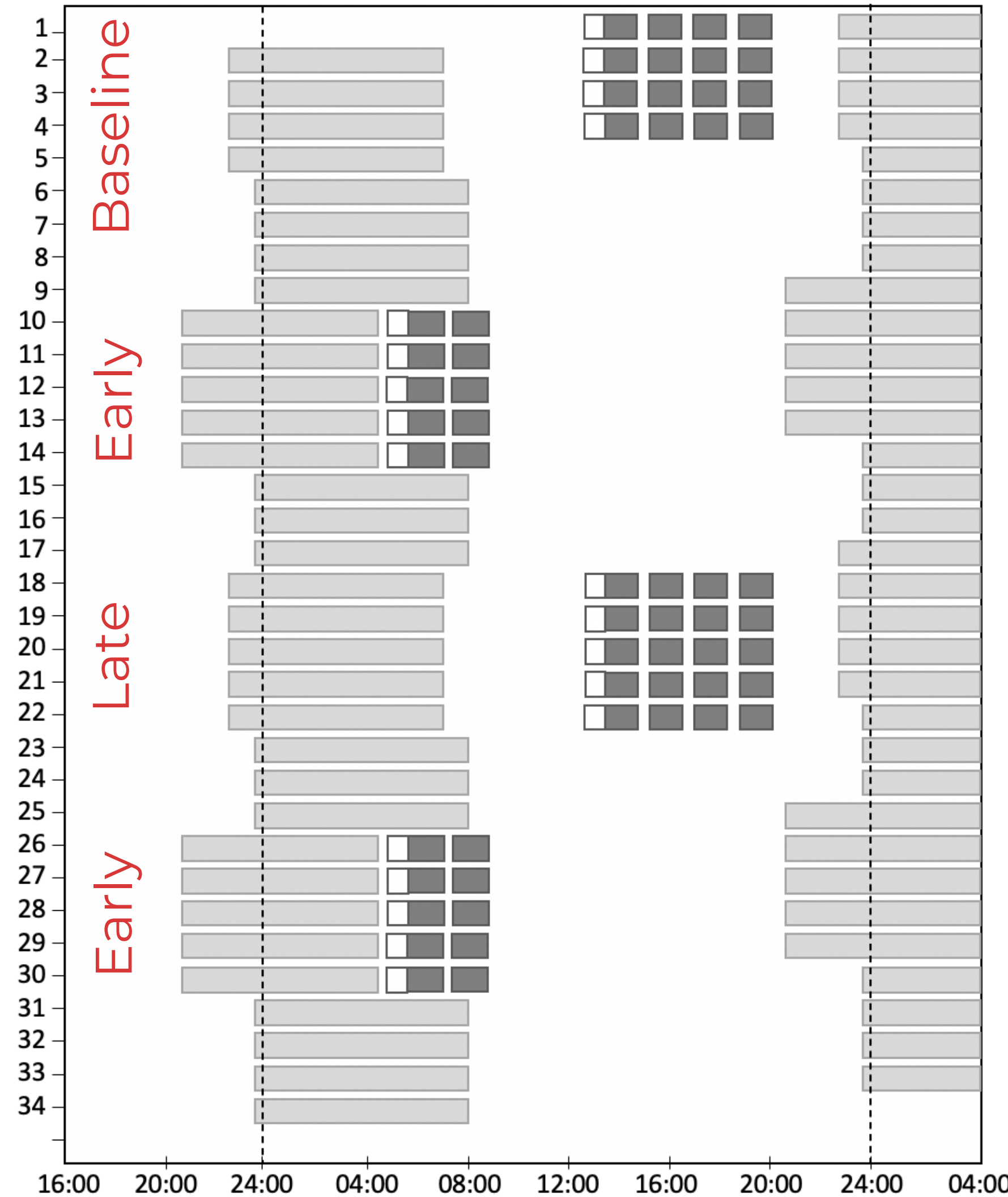
- Short-haul airline pilots
- Signed a consent form
- Oriented on study materials and procedures
- Each participant was provided with an iPod
- Oriented to the proper procedure of completing the NASA-TLX



STUDY PROTOCOL

n = 30 pilots

- Data collection: 34 days
- NASA-TLX and Hassle Factors
- Fixed-Pattern Design (FDP) roster schedule
- Return to home base
- No restriction on non-duty days



NASA-TLX

multidimensional workload scale

TASK:

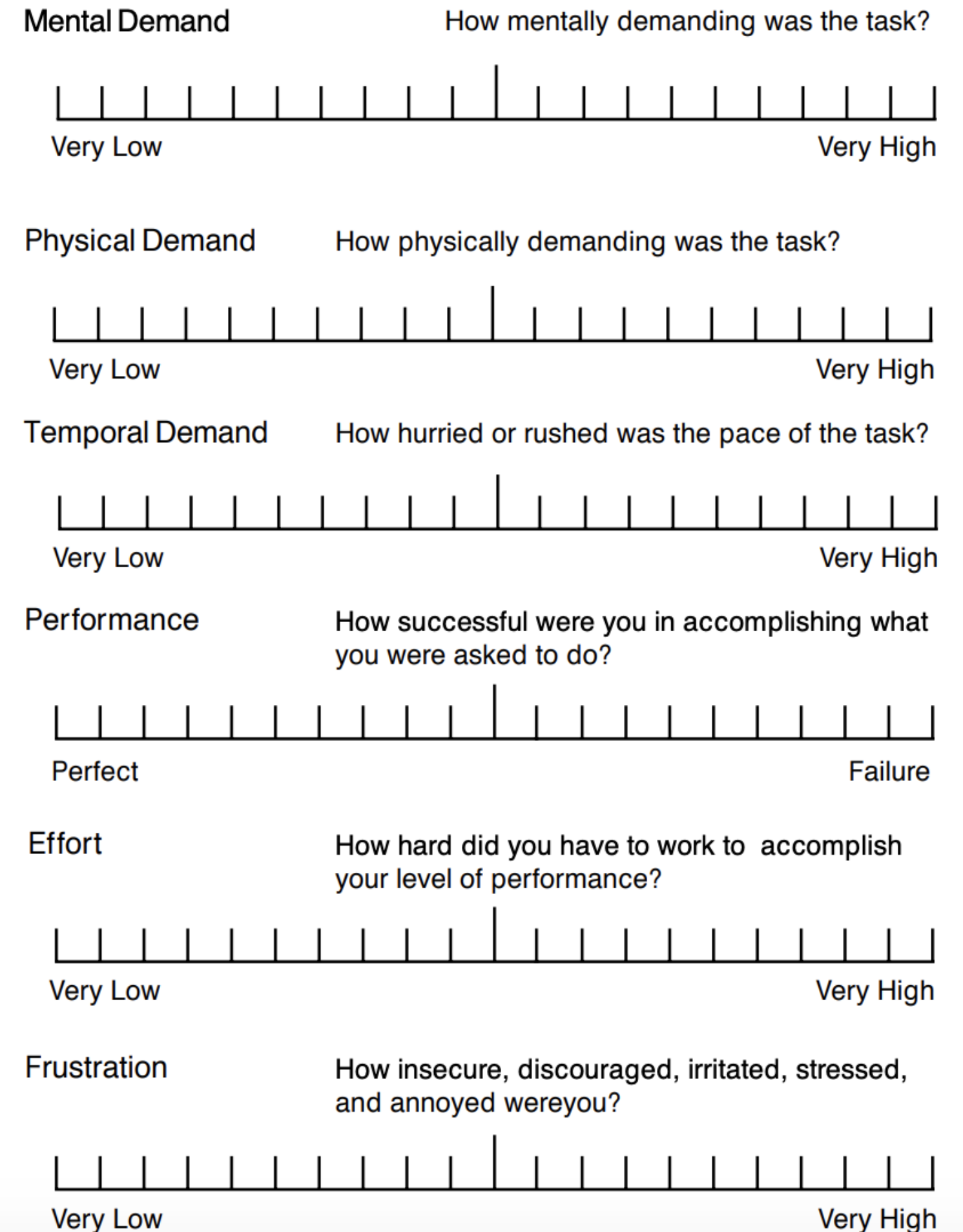
Mental demand
Physical demand
Temporal demand

BEHAVIOR:

Effort
Performance

INDIVIDUAL:

Frustration





HASSLE FACTORS



< Cancel

Hassle Factors

Save

SELECT EACH HASSLE FACTOR EXPERIENCED DURING FLIGHT. IF NONE EXPERIENCED, JUST HIT SAVE.

Airport Facilities

Cabin Activity

ATC

External Environment

Aircraft Environment

Training

Airline Disruption i.e. crewing a/c change

Procedures & Documentation

Human Factors

Team Factors

Experience

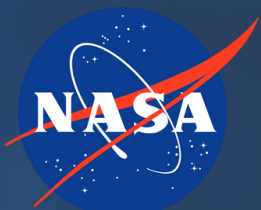
OTHER HASSLE FACTORS EXPERIENCED...

Tap here to type. Separate each with a comma (item1, item2, ...).

DEMOGRAPHICS

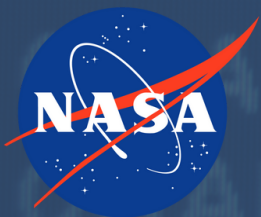
n = 30 (2 female)

	Mean +/- SD
Age	34.9 (9.2)
Flight hours	5,460.9(5,042.3)
Self-reported sleep need	7.9 (0.6)
MEQ score	50.5 (7.6)
ESS score	5.6 (3.3)



FLIGHT CHARACTERISTICS

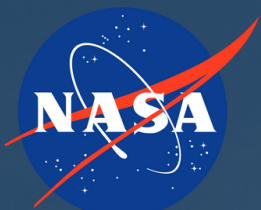
	n (duty days)	Time (SD)	Range (clock h)	Number of flight sectors	Flight duration
Baseline	129	13:59 (2:11)	09:05-20:12	2.64 (0.95)	1:50(0:32)
Early duty(1)	134	06:58 (1:14)	04:43-13:11	2.25 (0.65)	2:05 (0:37)
Late duty	133	13:39 (2:17)	09:02-19:18	2.67 (0.94)	1:54 (0:39)
Early duty(2)	134	07:16 (0:50)	05:49-10:11	2.28 (0.65)	1:59 (0:40)



RESULTS

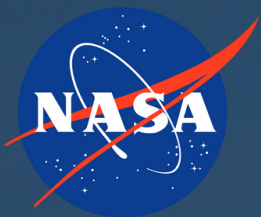
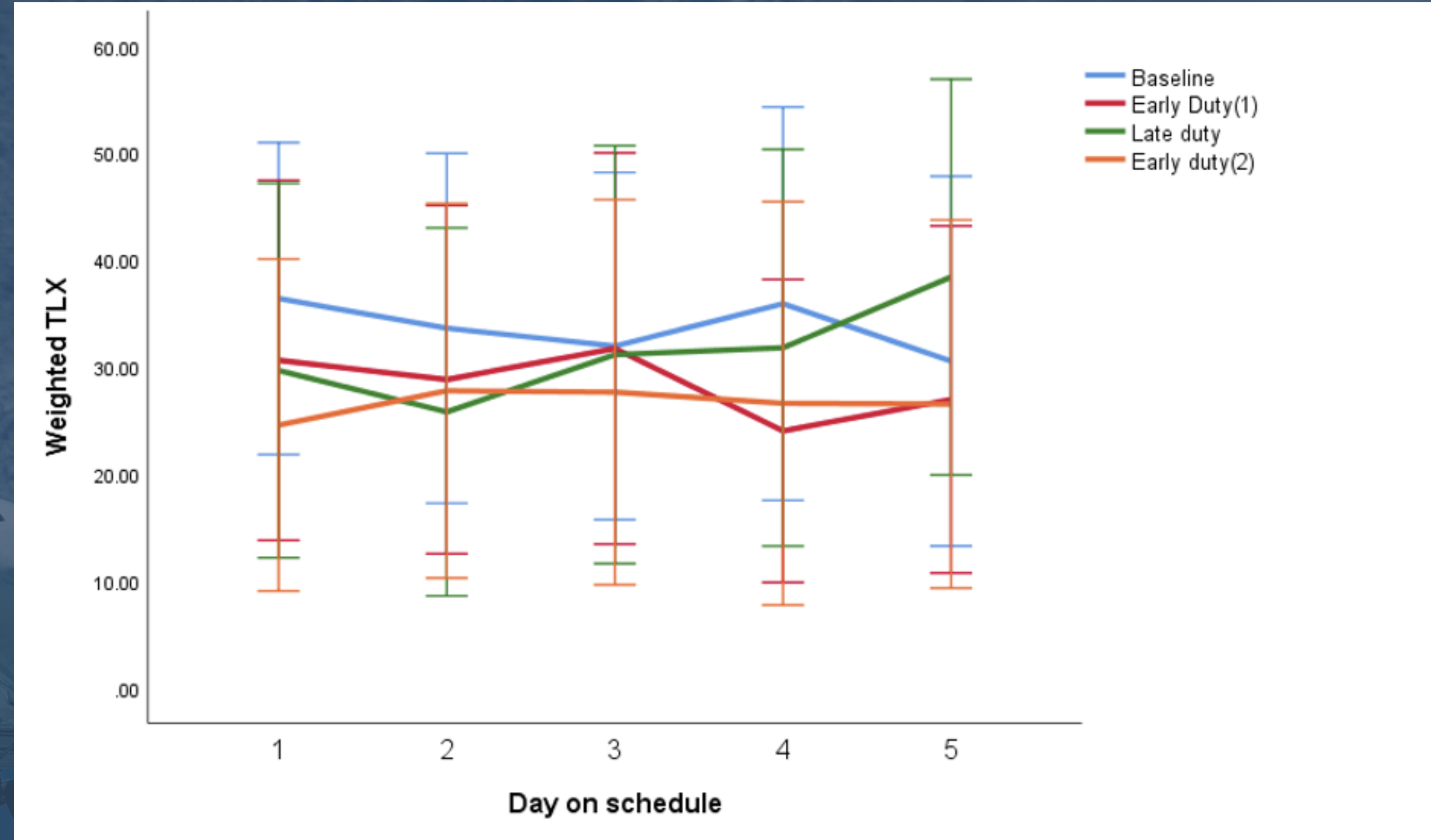
	n	Overall (weighted) (SD)	Mean raw TLX (SD)
Baseline	29	33.69(16.59)	31.16(14.87)
Early start(1)	30	29.05(16.92)**	27.44(14.73)*
Late duty	30	30.99(18.64)	28.96(15.99)
Early start(2)	30	26.58(17.37)***	25.27(15.51)***

* $p < .05$, ** $p < .01$, *** $p < .001$



RESULTS

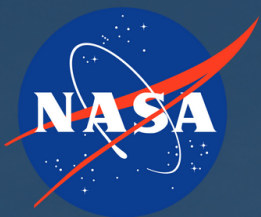
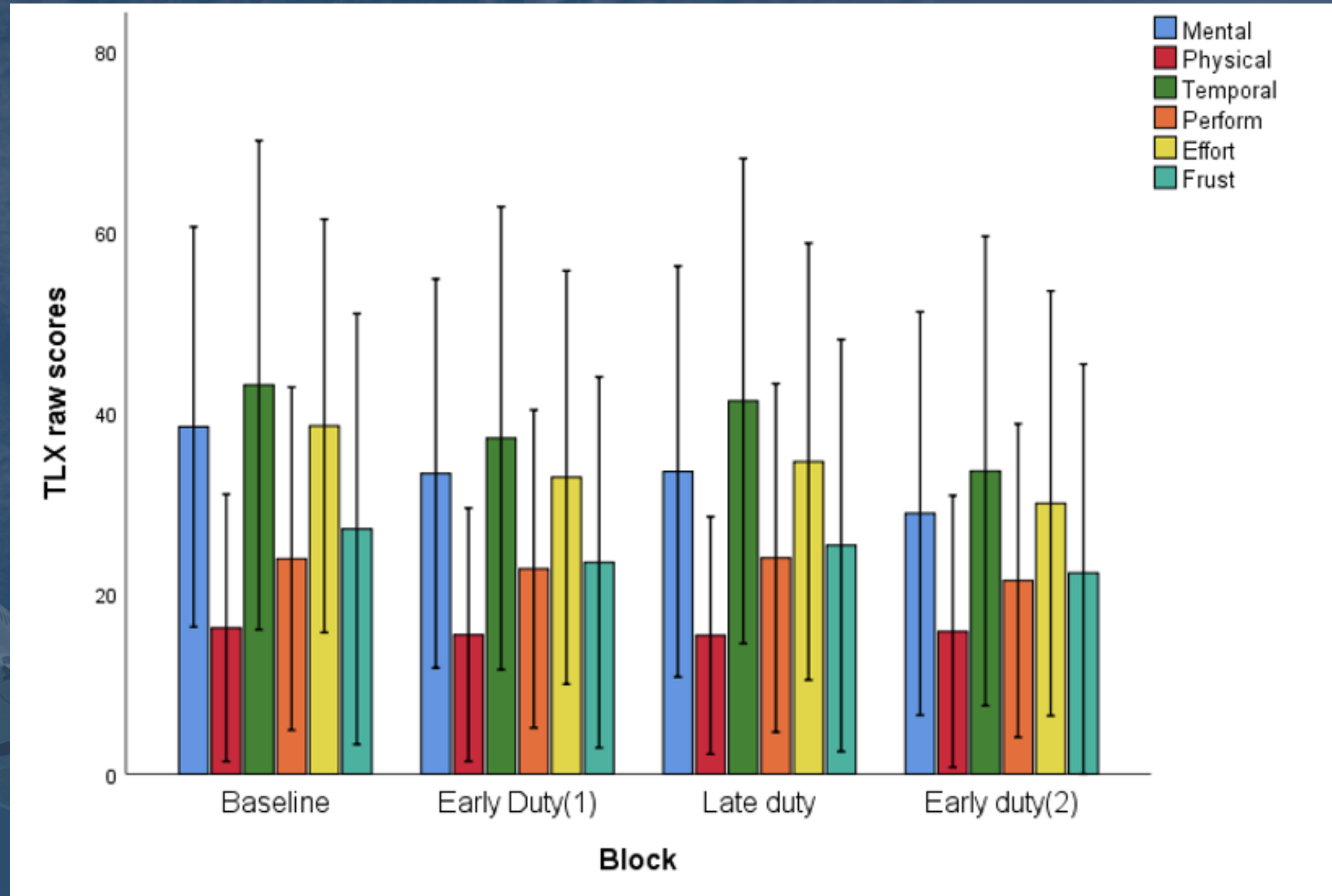
WEIGHTED TLX BY DUTY DAY



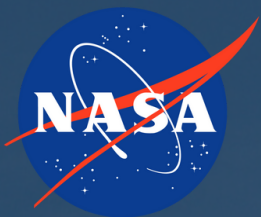
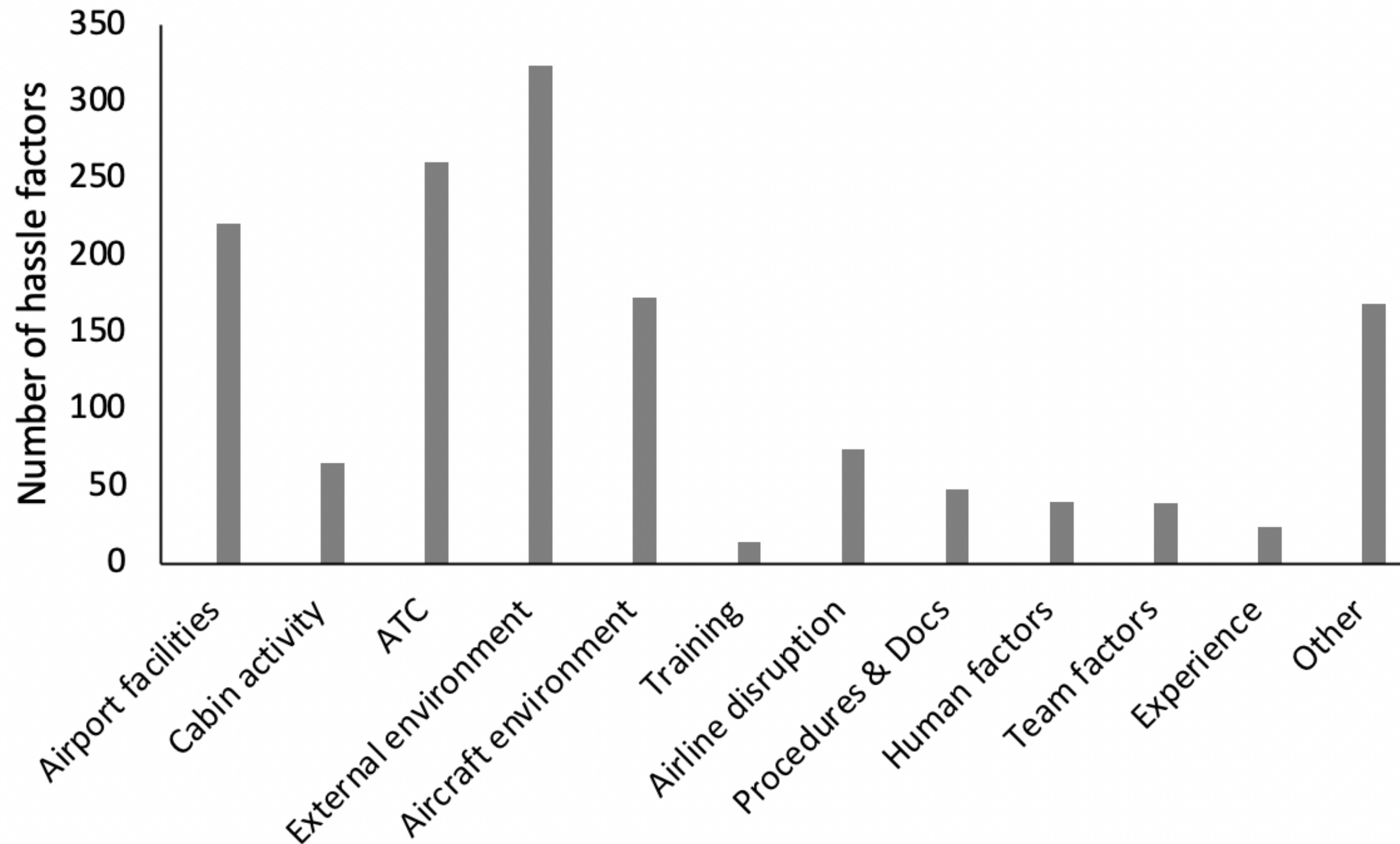
RAW TLX BY DUTY BLOCK

Low mental demand on all blocks

Low temporal demand, effort, and frustration on short duties



HASSLE FACTORS



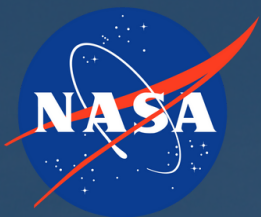
CONCLUSIONS

Higher workload on long duty blocks with multiple flight legs

Higher mental and temporal demands, effort and frustration on long duty blocks with multiple flight legs

Limitation: the timing of the data collection

Future research: including all phases of flight in data collection



THANK YOU

PILOT CREW

AIRLINE STAFF

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

