

Airline Pilot Perceptions of Stress and Self-Reported Fatigue: A Cross-Sectional Study

Michelle P. Hight

MPH Human Factors, LLC & Central Oregon Community College, mphhumanfactors@gmail.com

Stephanie G. Fussell

Kent State University, sfussel2@kent.edu

Eline Kok

eline@inspiredaviatrix.com

Debbie S. Carstens PhD,

Florida Institute of Technology, carstens@fit.edu

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Airline Pilot Perceptions of Stress and Self-Reported Fatigue: A Cross-Sectional Study

Authors & Affiliations

Michelle P. Hight, PhD, Stephanie G. Fussell, PhD,
Debbie S. Carstens, PhD, Eline Kok, BS
Central Oregon Community College
Kent State University
Florida Institute of Technology

01 Introduction

Over the past two decades, fatigue has gained increased regulatory emphasis in the aviation industry. The psychosocial construct of pilots' **perceived stress** has been less studied and emphasized, though decades of research demonstrate stress's impact on individual well-being and safety performance (Bor et al., 2017; Cullen et al., 2021).

Results support the validity of Cohen's (1983) Perceived Stress Scale (PSS) for assessing chronic stress among airline pilots, revealing that over half of airline pilots sampled admitted to flying, or continuing a flight, when they were feeling fatigued enough to question their fitness to fly.

Various demographics such as fleet, gender and age range showed statistically significant relationships to the results of the PSS. The researchers also measured the same pilots' perceptions of "**fatigue culture**" using a Likert scale and a follow-up open-ended comment section. The findings suggest a significant correlation between fatigue reporting culture and pilots' stress.

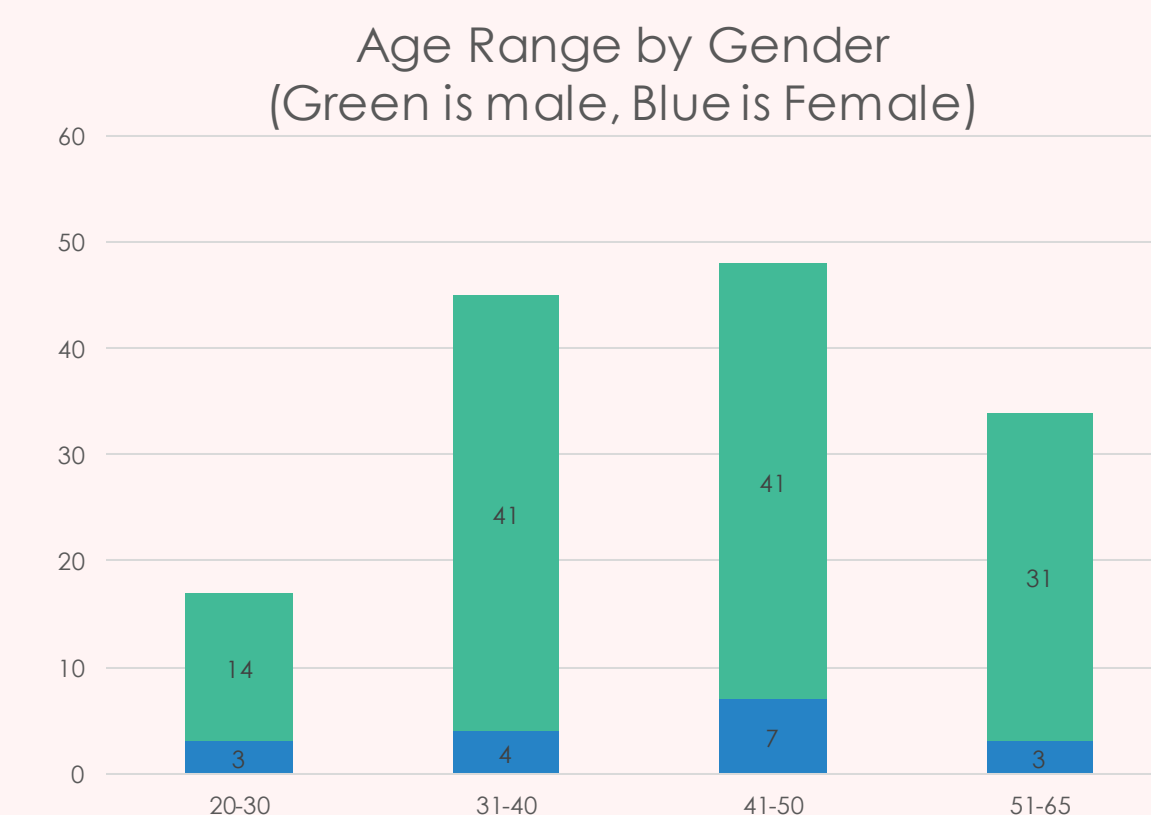
02 Methodology

This cross-sectional study measured airline pilots' perceived stress levels alongside selected demographics and fatigue factors.

- **RQ:** What is the relationship between individual chronic stressors and various fatigue factors?
- **Data Collection:** Sample of 144 major airline pilots
 - Optional questionnaire given *in person* during Continuing Qualification after an interactive fatigue and stress course.
 - 99% response & completion rate

Demographic Data:

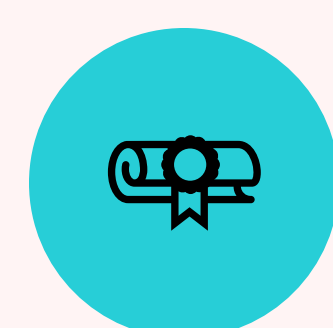
17 CA
4 CA
13 FO
127 CA
45 CA
82 FO



- **Stress & Fatigue Classifications:** Organizational, professional, social and biological factors



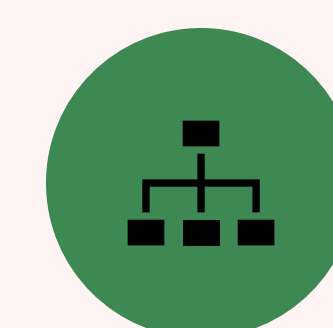
SOCIAL (CHILDREN AT HOME; COMMUTE TIME)



PROFESSIONAL (EXPERIENCE LEVEL)



BIOLOGICAL (RECOVERY TIME)



ORGANIZATIONAL (FATIGUE CULTURE; PRESSURE TO CONTINUE)

03 Measures & Analysis

Cohen's (1983) PSS was chosen as a reliable measure of perceived stressors. The PSS measures perceptions of chronic stress levels *over the previous month*. Researchers compared PSS scores with demographic categories and various organizational, professional, social and biological fatigue factors to classify and analyze which factors contribute most to chronic stress. Phi, Cramer's V, Kendall's tau-c, and Gamma nonparametric tests were used to test relationship strength.

04 Discussion & Limitations

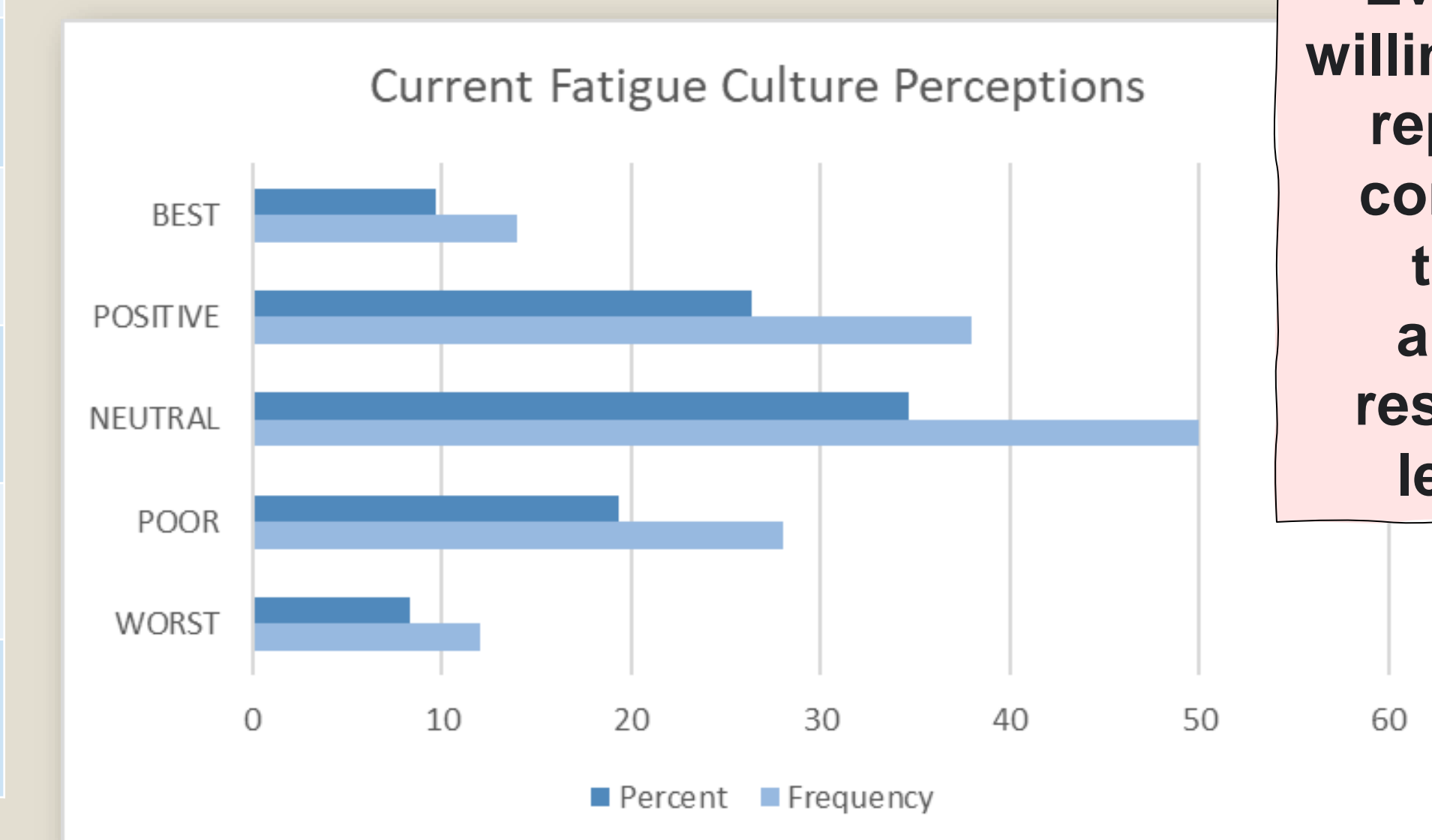
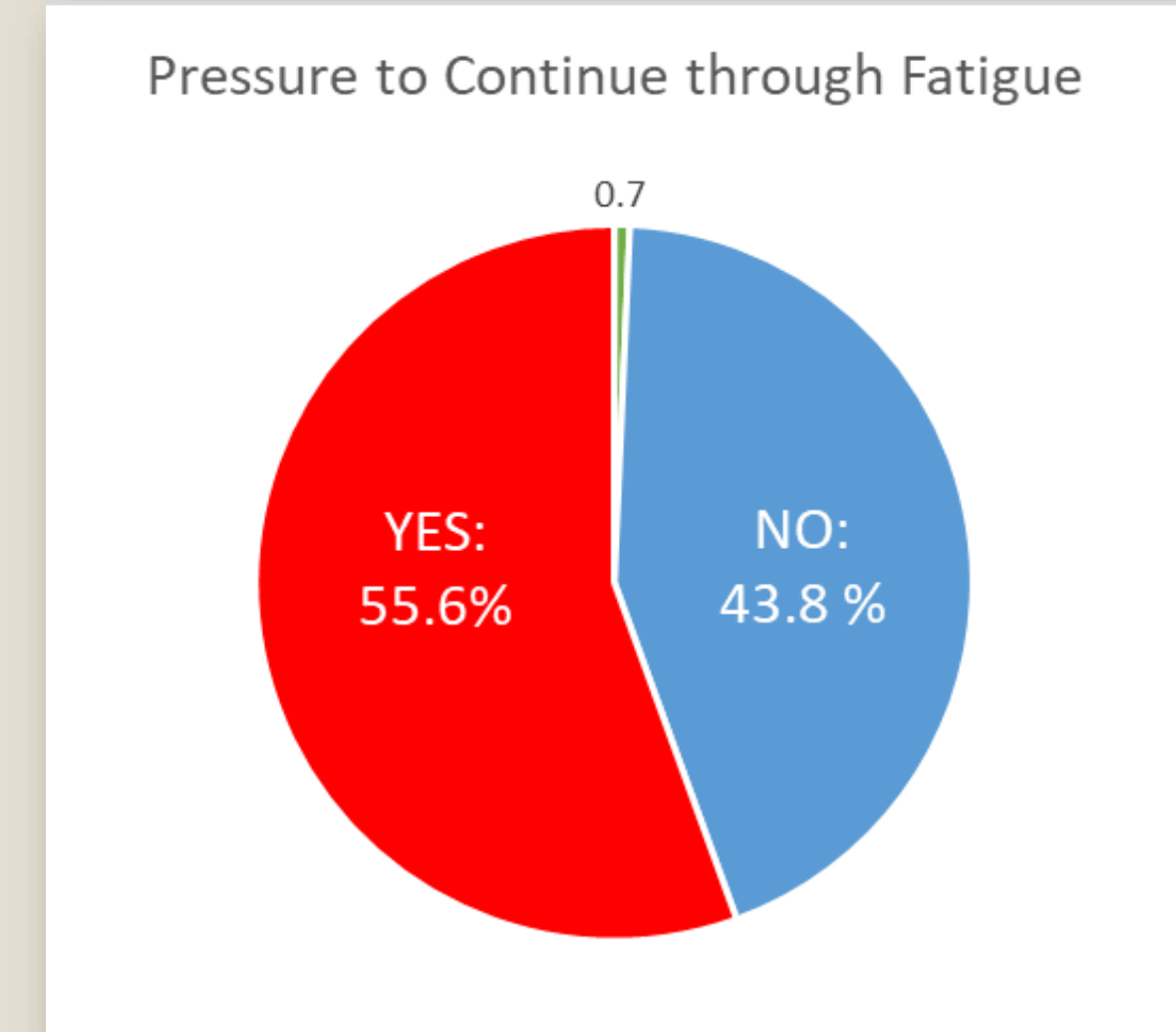
This study fills a gap in the literature on reliable, repeatable methodologies for studying chronic occupational stress among pilots, comparing two safety-influencing constructs not previously studied side-by-side. Due to sample size limitations and unequal proportions of various demographic representations, some of the data were inconclusive.

05 Results: Relative Significance of PSS Scores compared with Demographic & Fatigue Factors

These factors ARE related to PSS score:

Item	Test	Relationship Interpretation
Q13 Fleet	Cramér's V, .273, $p = .30$	Very strong
Q14 Gender	Phi, $-.198, p = .018$	Strong, negative
Q15 Age Range	Kendall's tau-c, $-.208, p = .017$	Moderate, negative
Q21 Fatigue Factors	Gamma, $-.317, p = .017$	Strong
Q23 Fatigue Culture	Kendall's tau-c, $.179, p = .024$	Weak
Q24 Fitness to Fly	Gamma, $-.317, p = .024$	Strong
	Kendall's tau-c, $-.263, p < .001$	Moderate, negative
	Gamma, $-.444, p < .001$	Strong
	Cramér's V, $.221, p = .030$	Strong

"Have you ever flown a trip, or continued a trip when you were feeling fatigued enough to question your own fitness to fly?"



"Everyone feels willing and able to report fatigue concerns, and there is an appropriate response from leadership"

06 Future Research

This research project expanded the body of knowledge on assessments for the difficult-to-measure perceptions of chronic stressors and fatigue factors that pilots face in the airline industry. This study, along with several recent events involving pilot mental health problems, highlights the relevance of additional emphasis on stress, not simply fatigue mitigations. The implications of qualitatively exploring a relationship between these two related safety-influencing constructs may provide a different angle for future practical solutions and regulatory guidance.

07 References

- Bor, R. Eriksen, C. Oakes, M. & Scragg, P. (Eds.) (2017). *Pilot mental health assessment and support: A practitioner's guide*. New York, NY: Routledge.
- Cullen, P., Cahill, J. & Gaynor, K. A. (2021). Qualitative study exploring well-being and the potential impact of work-related stress among commercial airline pilots. *Aviation Psychology and Applied Human Factors* 11(1), 1-12. <https://doi.org/10.1027/2192-0923/a000199>
- Cohen, S. Kamarck, T. & Mermelstein, R. (1983, December). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385-396. <https://doi.org/10.2307/2136404>

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