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ACADEMIC WORKLOAD, PERCEIVED STRESS, AND WILLINGNESS TO PILOT

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Abstract

This study found no relationship between perceived stress and number of credits. However, willingness to pilot (WTP) for flight students in a Part 141 flight training program was significantly lower with three or more exams than with one or two exams.

Background

- The relationship between academic workload and stress is a delicate balance, wherein both an excessive and a limited workload can reduce student performance (Young, 2008).
- An exorbitant workload may increase mental health complications and the risk of errors, which present safety issues to pilots in training (Guerra, 2022).
- Stress has been measured both acutely and chronically, and short-term stress may improve performance (Vallés-Catalá et al., 2021).
- Certain tactics, such as auto-suggestions, have been found to improve stress management in students (Kathyayani et al., 2022).

Purpose and Research Questions

The purpose of this study was two-fold: to investigate the effect of academic workload on WTP (Rice et al., 2020) in 3 scenarios and to examine the relationship between the number of credits taken in a semester and perceived stress (Cohen, 1983) with respect to student pilots at a collegiate Part 141 program in Florida.

1. Is there is difference in students' WTP in a week with one exam, two exams, and three or more exams?
2. What is the relationship between the number of credits taken per semester and the score on the perceived stress scale (PSS)?

Methods

- IRB exemption was approved (23-030). We use a stratified cluster sample of the collegiate Part 141 Flight training program's ground school courses.
- This project had correlational and quasi-experimental designs, and the survey used a within subjects' design.
- WTP scale (Rice et al., 2020) with Likert scale scores converted to numerical values, and the PSS (Cohen, 1983) were the instruments.
- For WTP, three scenarios were offered: a week with one exam, two exams, and three or more exams.
- A one-way repeated measures ANOVA, a Post Hoc Test for pairwise comparisons, eta-squared for effect size, and Pearson's Correlation were conducted in R-Studio.

Results

We received 58 responses. Five responses were excluded from the analysis for various reasons, leaving a sample size of 53. The participants had an average age of 18 – 25 years old. International students comprised 20 of the 53 responses.

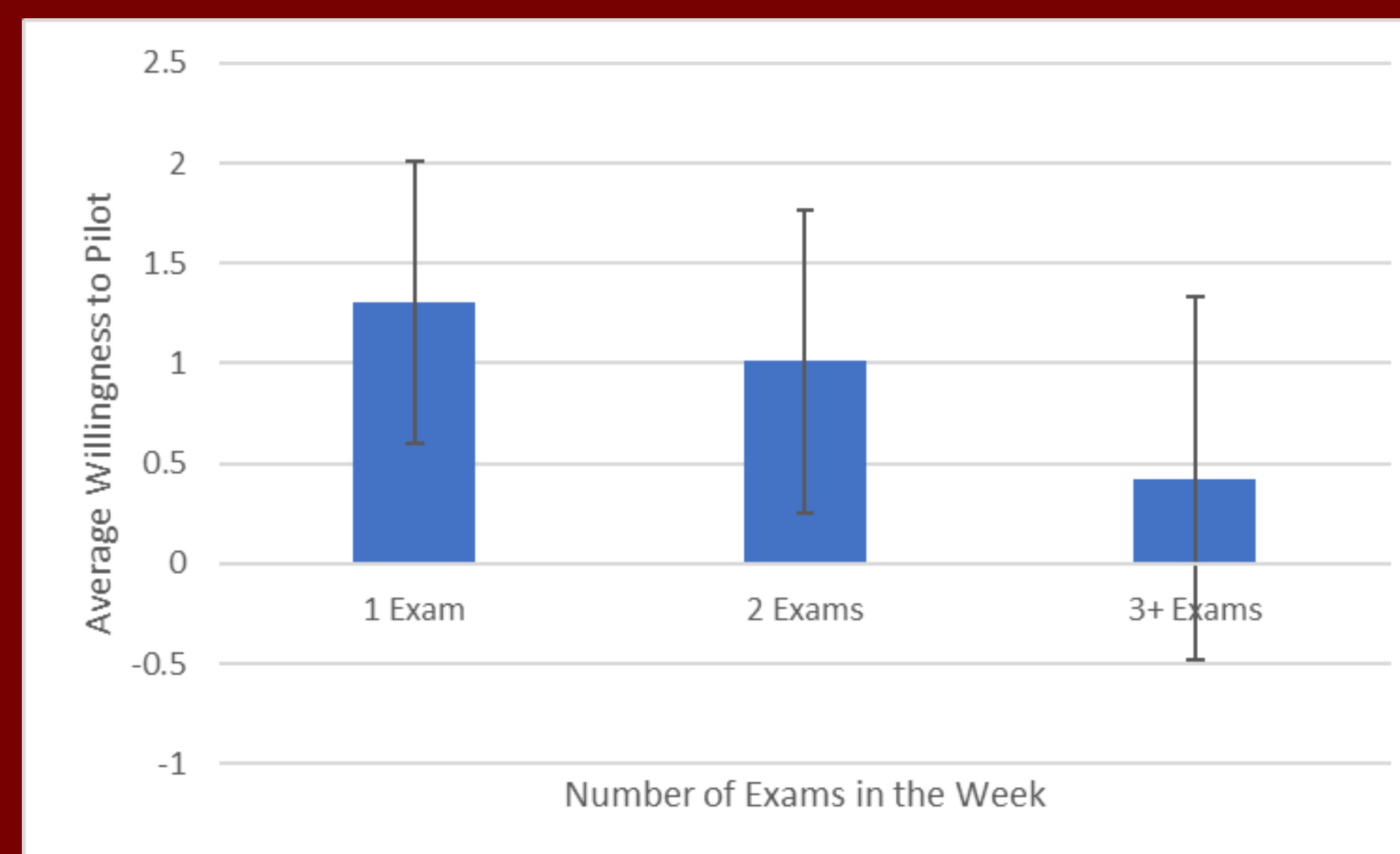


Figure 1: Average Willingness to Pilot scores by Exam scenario

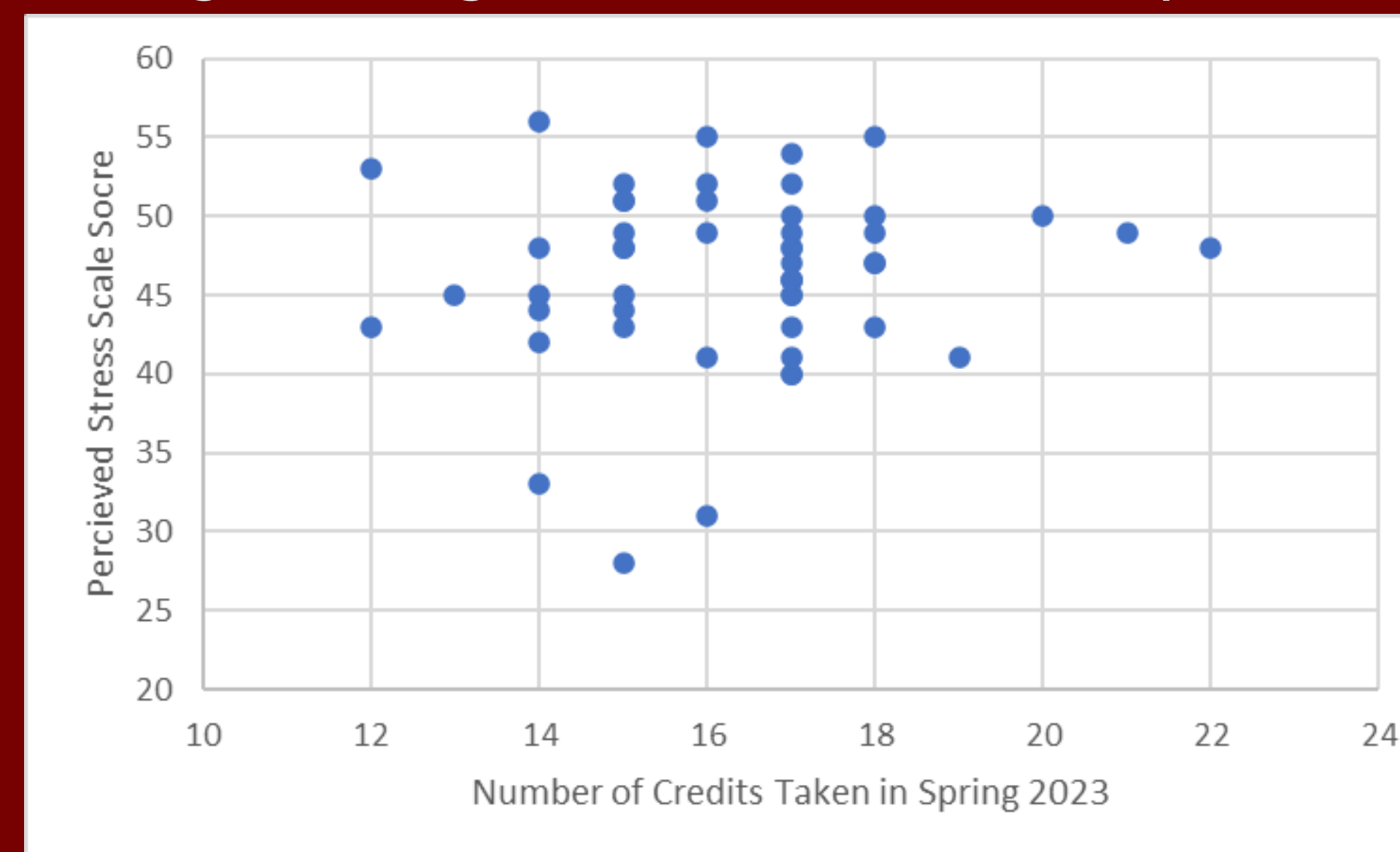


Figure 2: Perceived Stress Scale scores vs. credits in Spring 2023.

Cronbach's alpha was .96 for the one exam scenario, .94 for the two exams scenario, and .95 for three or more exams. For the PSS, the alpha was .84. These all represent excellent or good internal reliability; therefore, we used the average WTP for each scenario and calculated a single PSS value as specified (Cohen et al. 1983).

The Pearson's Correlation Coefficient for stress and number of credits per semester was -0.093 ($p=.5$). The ANOVA showed a significant effect of exams on WTP: $F(2, 155) = 16.41$, $p < .001$. Post hoc pairwise comparisons showed that only the three or more exams condition was statistically different from two and one exams ($p < .001$).

The eta squared was 0.17; this represents a large effect size.

Discussion

For the WTP question, we hypothesized that the scores would decrease as the number of exams in the week increased. This hypothesis was correct, as illustrated in Figure 1. For the one exam scenario, the average response was 1.3, indicating a higher willingness to pilot than the one with two exams, which had an average response of 1.01, and scenario with three or more, which had an average response of 0.43. The three or more-exam week had significantly lower WTP than the other two scenarios.

Perceived stress of students was not correlated with the number of credits they are taking in the current semester (Figure 2). This was contrary to our hypothesis that there would be a relationship. There were four outliers: three with lower and one with higher stress on the PSS. These results may be attributed to how each individual deals with stress; one person may be able to handle a higher workload better than others. This supports prior research on high workloads over a long term and can lead to increased stress levels (Guerra, 2022). Another possible explanation points to the intensity of the coursework being a more defining variable, rather than the number of classes, or the fact that stress fluctuates over the course of a semester.

The number of credits per semester had a slightly negative relationship with the scores on the PSS scale, but the relationship was not significant. Student pilots had statistically lower WTP for the three or more exams scenario, compared to a week with one or two exams. This suggests that flight training programs may consider this when scheduling exams or anticipating cancellations around the week of finals.

Future Research

Further research should be conducted on performance in relation to academic workload for Part 141 flight students to understand its effects on safe flight. Additionally, research is needed on the effects of stress on flight students and the everchanging balance of stress and workload in terms of remediation and management.

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