Mar 3rd, 10:45 AM - 12:00 PM

# Prevalence of Invulnerability in Collegiate Part 141 Flight Students

Andrew Nakushian
*Florida Institute of Technology - Melbourne*, anakushian2016@my.fit.edu

Aayush Kapar
*Florida Institute of Technology - Melbourne*, akapar2016@my.fit.edu

Kenley Ryan
*Florida Institute of Technology - Melbourne*, kryan2016@my.fit.edu

Rian Mehta Ph.D.
*Florida Institute of Technology - Melbourne*, rianmehta91@gmail.com

Brooke Wheeler Ph.D.
*Florida Institute of Technology - Melbourne*, bwheeler@fit.edu

FLORIDA TECH

FLORIDA'S STEM UNIVERSITY™

# Prevalence of Invulnerability in Part 141 Flight Students

**Andrew Nakushian, Aayush Kapar, Kenley Ryan, Brooke Wheeler, Rian Mehta**

Florida Institute of Technology

# Purpose

The purpose of this study was to determine the prevalence of invulnerability in collegiate Part 141 flight students based on experience level as it relates to ground school-based knowledge

FLORIDA TECH

# Background

- In the 1970s, the Federal Aviation Administration (FAA) was interested in the process of aeronautical decision making. Sponsored research studied how to teach pilots to make good decisions (Berlin et al., 1977)

- Hazardous attitudes play a big role in aviation-based incidents. Research has found that with an increase in experience, the prevalence of invulnerability went up in glider pilots until about 27 years of experience (Blais, 2010).

- Training standards do put an emphasis on training on dealing with hazardous attitudes.The Part 141 curriculum contains ground courses from PPL to CFI training, separated by certificate (Federal Aviation Administration, 2017).

FLORIDA TECH

# Significance

- Invulnerability is one of the five hazardous attitudes, as identified by previous research (Berlin et al., 1977)
- Elevated levels of invulnerability could pilots at a higher risk of being involved in an accident.
- Knowing the prevalence of invulnerability is essential because if it were prevalent at specific levels, it would indicate for future updates to the current curriculum outcomes regarding Part 141 training syllabi.

FLORIDA TECH

# Operational Definitions

- Invulnerability – scores from the specific questions on Hunter's (2005) New-Hazardous Attitudes Scale

- Ground school course – 5 different collegiate courses that were designated for training the following levels respectively, private pilot, commercial time building, instrument, commercial, and flight instructor.

# Research Question and Hypothesis

RQ: What is the prevalence of invulnerability in collegiate Part 141 flight students based on ground school course enrollment?

Hypothesis: There will be a statistically significant difference in the invulnerability where invulnerability will be the highest in the instructional techniques class.

- Sense of high knowledge
- Surrounded by others with lower knowledge levels
- Completion of flight courses at a collegiate level

FLORIDA TECH

# Methodology

- IRB Exemption (IRB # 19-160)
- We administered a 30-question short form of the Hunter (2005) New Hazardous Attitudes Scale to undergraduate students in five different 141 Ground School courses. These represented private pilot, commercial time building, instrument, commercial, and flight instructor. Of the 30 questions 5 are used to measure invulnerability specifically.
- The 5 questions were on a 5 Point Likert-type scale. Invulnerability Scores can therefore range from a low of 5 to a high of 25.
- Participant demographic data regarding age and flight experience was also collected.

FLORIDA TECH

# Results

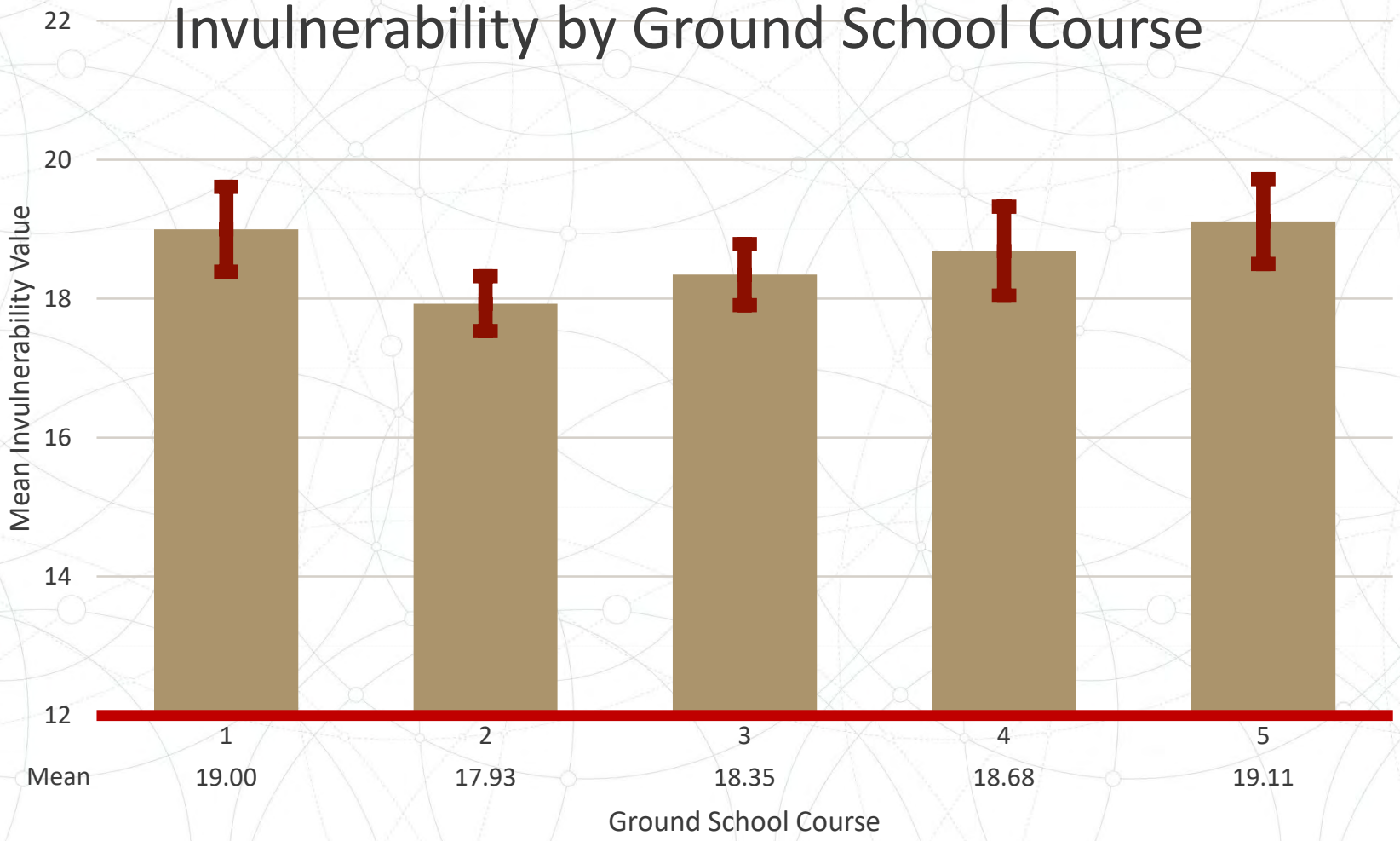
- A useable sample size of 114 participants was obtained from a Part 141 flight program at a university in Florida. Mean age of participants was 20.06 years (SD=2.50)

- A one-way between-subjects ANOVA was conducted to test for statistical differences in invulnerability scores.

- No statistically significant difference was found in invulnerability based on the ground school course being taken, $F$ (4,104) = .846, $p$ = .499. partial eta squared = .031.

FLORIDA TECH

# Results


Invulnerability by Ground School Course
Mean Invulnerability Value
22
20
18
16
14
12
1
2
3
4
5
Mean
19.00
17.93
18.35
18.68
19.11
Ground School Course

# Discussion

- Rejection of our initial hypothesis
- Possible explanations regarding the data include:
  - Not enough data points collected.
    - Invulnerability was only 1 out of 5 hazardous scales in the survey.
  - All the courses are standardized, and they build on each other as part of the Part 141 curriculum.
    - signify importance of hazardous attitudes from the first course in flight training.
  - Expression of invulnerability might not be affected by conceptual knowledge.
    - Experience might play a bigger role than knowledge

FLORIDA TECH

# Limitations

- Use of a self-assessment measure
- Limited generalizability due to the sample characteristics.
- Differences in professor teaching style and engagement can be a confounding variable.
- Differences in flight instructor teaching styles and emphasis areas could also add to the confounds of the study (Wetmore et al., 2007)

# Areas of Future Research

- Using the full 88-question version of the New-Hazardous Attitudes Scale.
- Using the collected data set to see if there are relationships between other hazardous attitudes and ground school course.
- Using different measurements of experience other than current course.
- Replicating this research with other collegiate flight programs and with non 141 flight programs as well to determine if these effects (or lack there of) are consistent in the training industry.

FLORIDA TECH

# References


- Blais, A.R. (2010). Flight experience, risk-taking, and hazardous attitudes in glider instructors. Defence R+D Canada- Toronto

- Berlin, J.I., Gruber, E.V., Holmes, C.W., Jensen, P.K., Lau, J.R., & Mills, J.W. (1977). Pilot judgment training and evaluation—Vol.1 (Rep.No.DOT/FAA/CT–81/56–I). Washington, DC: Federal Aviation Administration.

- Federal Aviation Administration. (2017, September). Advisory circular 141-1B, Part 141 Pilot Schools, Application, Certification, and Compliance Retrieved from https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_141-1B.pdf

- Hunter, D. R. (2005). Measurement of hazardous attitudes among pilots. The International Journal of Aviation Psychology, 15(1), 23-43. doi:10.1207/s15327108ijap1501_2

- Wetmore, M., Lu, C., & Caldwell, W. (2007). The effects of pedagogical paradigms on aviation students with hazardous attitudes. Journal of Aviation/Aerospace Education & Research, 16(3), 25-34. Retrieved from https://search-proquest- com.portal.lib.fit.edu/docview/1689390176?accountid=27313


FLORIDA TECH

FLORIDA TECH

FLORIDA'S STEM UNIVERSITY™

# Thank you.

**Questions/Comments?**