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Personal Safety Culture: A New Measure for General Aviation Pilots

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Presenter Information

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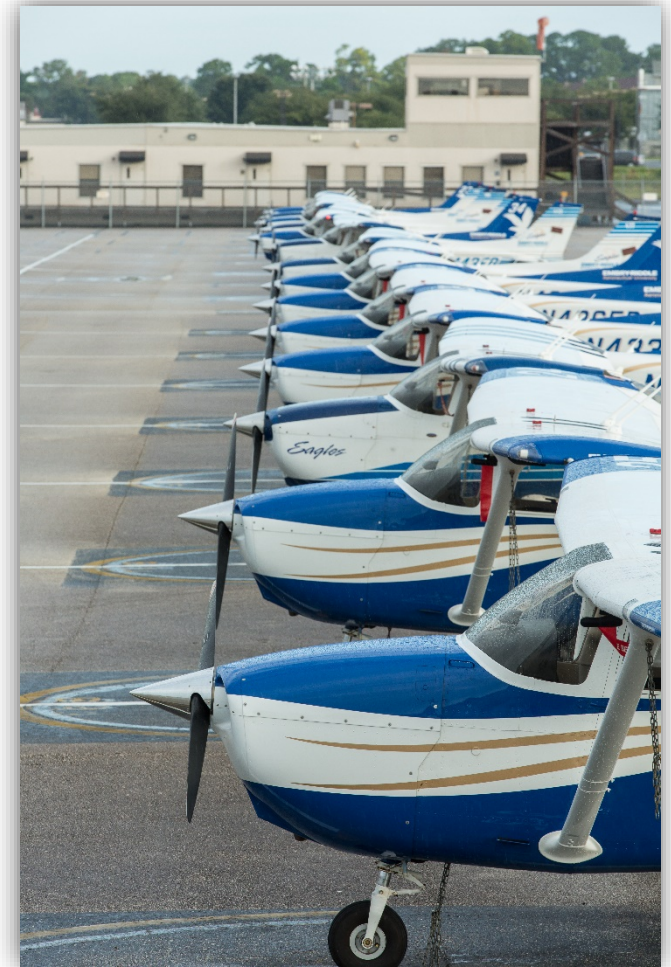
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Presentation Overview

- Why did we do it?
- How did we do it?
- What is next?



Why did we do it?

- Loss of Control Working Group
 - Two-year review
 - Multiple safety recommendations
- Safety Enhancement 33 (SE-33)

Need for a scale to measure safety culture of those general aviation pilots who operate outside of a formal flying organization



How did we do it?

- Conducted literature review
 - 167 documents
 - Key theme in literature: organizational safety culture
- Developed an initial instrument
 - Identified 5 themes w/ 5-7 questions per theme
 - Adopted risk perception from Hunter (2006)²
 - Enlisted expert review for Face Validity
- Collected data
 - 379 surveys collected
 - Target was 300 for statistical analysis
- Analyzed and provided initial psychometrics
 - Instrument revised based on analysis

Methods

- Surveyed 379 pilots (45 female); average participant age was 22.03 ($SD = 5.17$) years old
- Minimum requirements; 18 years old and at least private pilot certificate
- Participants reported an average of 377.38 ($SD= 727.12$) total flight hours with an average of 19 ($SD = 20.97$) hours in previous 30 days
- A 33-question instrument was developed using a 5-point Likert scale
- Data gathering occurred during the Spring 2018 semester
- Sample of 300 was the target for the principle components analysis (PCA)³

Results

- 344 of 379 questionnaires were deemed usable due to skipped questions
- Six questions removed; 27 items met criteria for the PCA
 - Three did not meet correlation coefficient requirements
 - One did not meet Kaiser-Myer-Olkin (KMO) requirements
 - Two were incorrectly coded in the instrument design
- PCA pre-checks indicated remaining data could be factorized
- Five components had eigenvalues greater than one suggesting retention⁴
 - This make-up explained 60.94% of the total variance
 - Used Varimax orthogonal rotation; solution was a 'simple structure'⁵
- Bottom line: the components were deemed consistent with safety culture

Preliminary 5 Factor Scale Sections

Proposed Factors

- Personal commitment
 - 5 items
- Risk perception
 - 9 items
- Responsibility
 - 6 items
- Safety reporting
 - 7 items
- Learning
 - 6 items

Identified Factors

- Safety Attitudes
 - 11 items
- Risk Perception
 - 6 items
- Safety Citizenship
 - 3 items
- Safety Reporting
 - 4 items
- Safety Practice
 - 3 items

What is next?

- Expand data collection
- Conduct confirmatory factor analysis



Summary

- Improving GA safety is vital; ERAU provided expertise to aid safety efforts
- Project based on comprehensive literature review
- Initial data analysis resulted in development of 5 factor scale
- Next step is to expand data collection

Acknowledgement

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QUESTIONS?



References

¹All photos credited to Embry-Riddle Aeronautical University

²Hunter, D. R. (2006). Risk perception among general aviation pilots. *The International Journal of Aviation Psychology*, 16(2), 135-144. doi: 10.1207/s15327108ijap1602_1

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