Personal Safety Culture: A New Measure for General Aviation Pilots

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Personal Safety Culture: A New Measure for General Aviation Pilots

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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 retention\(^4\)
  – 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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References

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