Remembrance of Cases
Past:
Who Remembers What, When
Confronting Critical Flight Events

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Introduction
- Intelligent behavior in the present requires the ability to profit from the past.
- It is arguable that every possible conceivable event in aviation experience has already occurred.
- Almost three-quarters of accidents are due to pilot error (AOPA)
- Problem: Collective failure to learn from past experience to reduce amount of accidents due to pilot error

Purpose
- Determine whether pilots relied more on procedure or personal experience
  - Recall would support naturalistic forms of reasoning
  - Are older pilots better at problem solving?
- Test the nature of a pilot's recall
  - Sample age and experience of a pilot
  - Sample the types of events a pilot recalls
  - Ask for the opinions of a pilot about on recall's value

Case-Based Reasoning
- Individual responds to events based on remembering similar past events
- Experts assess current and previous cases to compose a solution
- Blending: past events are "amalgamated" to create a general solution
Critical Decision Method

- Based on the ability to recall a previous case
- Questions are posed about the prior event and compared to several recent cases
- Relies on an expert’s knowledge of these relational events, rather than guidelines

Autobiographical Memory

- Refers to the memory of some aspect of an event in personal history
  - Actual experience
  - Reading about an experience
- Pilots keep a logbook of all events that occur during flight

Experimental Method

- Survey in two parts
  - First Part asked for basic pilot information such as age, flight hours, credentials, etc
  - Second part: Have you ever recalled a previous Critical Flight event during a current CFE?
- Participants
  - 1081 Online surveys were filled out
  - 162 of 750 paper surveys were returned
  - Primary sample was U.S., Aus., and N.Z.

Results

- Demographics
  - 91.2% were men, Ages ranged 17 to 79
  - 45.6% had Bachelors, 34.6% with Masters
  - 4 to 33,000 hours, 0 to 61 years of experience
- CFE Recall
  - 52.5% of respondents said they recalled a previous CFE during a current CFE
  - Previous CFES generally occurred 5 years prior
  - CFES were recalled early during an event
  - 89.3% said the prior CFE was useful
Characteristics of the CFE
- Response could apply to more than one

Phase of flight in which CFEs occurred
- “Hours and hours of boredom punctuated by moments of extreme terror.”

Point during which CFE was recalled
- Previous CFEs were most valuable in assisting the pilot in identification of the current CFE and deciding what to do

Comparison of Online vs. Paper
- All non-U.S., N.Z., Aus. responses were deleted
  - 162 -> 144 Paper
  - 1081 -> 958 Online
- Paper responses were younger and less-educated
- Less CFE recall in paper responses
  - Paper responders were less-likely to endorse CFE recall as well
Discussion
- More than half of responding pilots said they recalled CFEs.
  - Large portion came from written sources.
- Older pilots did recall more CFEs than younger pilots.
- Air-Transport pilots had a higher rate of recall than other types.
- Learning from others was uniformly endorsed by most pilots.
- Web-based surveys are legitimate.

Conclusions
- Justifies that case-based training would be useful in aviation.
- Cases need to be sufficient enough for pilots to form generalizations.
  - Virtual Learning Environments
  - When designing, it is important to simulate both Weather and Equipment Failure.

Expertise
- Experience is needed, but not sufficient, to be an expert.
- Variety vs. Quantity
- Reflection and study of cases increases one’s ability to form useful information about it.