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**The relationship between risk-seeking behaviours
and risk-taking in-flight.**

**A thesis presented in partial fulfilment of the requirements for the
degree of**

Master of Arts

in

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New Zealand

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ABSTRACT

Aviation safety statistics show that accident levels are increasing, especially in the area of General Aviation. Ever since aviation became a viable option for travel, research has sought to explain the potential causes for accidents and has found that the most common cause is Human Error. This can be defined as any action or in-action that results in an accident that is a direct result of piloting behaviours, such as risk-taking in-flight. Models to guide training organisations in how to best compensate for the affects of Human Error have been developed, however, even with the development of these models, the number of fatalities caused by aviation accidents continues to rise. The current research was developed to investigate the possible relationship between everyday risk-seeking behaviours and risk-taking in-flight. Using a three study format, it first sought to investigate whether there were areas of aviation flight safety which were believed to be of concern by a New Zealand flight instructor focus group. A pilot group study was then used to investigate face, content and construct validities of the Cognitive Appraisal of Risky Events scale (CARE) and Domain-Specific Risk-Taking (Adult) Scale (DOSPERT) on a New Zealand population, for use in study three. Using an online survey presentation the relationship between everyday risk-seeking behaviours and risk-taking in-flight was examined. The survey consisted of presenting participants with the two psychometric measures designed to assess everyday risk-seeking behaviours and sixteen risky in-flight vignettes to measure confidence in taking risks in-flight. Results from the focus group found that the flight instructors believed the areas of alcohol, caffeine, breaches in class two medicals and pilot fatigue levels were all of concern to aviation flight safety. It was found that there were statistically significant relationships between everyday risk-seeking behaviours against the levels of confidence in risk-taking in-flight. Implications of the findings were discussed and finally proposals for further lines of research.

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DEFINITIONS

Definitions that relate back to a 'Part' are taken from the *Civil Aviation Rules 2010* (Civil Aviation Act, 1990). Where the entire definition was not relevant to the current research, it was shortened to contain only the information that related directly. All other definitions are derived from personal communications with J. Lanham (General Manager, General Aviation, Civil Aviation Authority of New Zealand, 15 June, 2011).

Accident means an occurrence that is associated with the operation of an aircraft and takes place between the time any person boards the aircraft with the intention of flight and such time as all such persons have disembarked and the engine or any propellers or rotors come to rest, being an occurrence in which—

(1) a person is fatally or seriously injured as a result of—

(i) being in the aircraft; or

(ii) direct contact with any part of the aircraft, including any part that has become detached from the aircraft; or

(iii) direct exposure to jet blast—

except when the injuries are self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to passengers and crew; or

(2) the aircraft sustains damage or structural failure that—

(i) adversely affects the structural strength, performance, or flight

DEFINITIONS

characteristics of the aircraft; and

(ii) would normally require major repair or replacement of the affected component—

except engine failure or damage that is limited to the engine, its cowlings, or accessories, or damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents, or puncture holes in the aircraft skin; or

- the aircraft is missing or is completely inaccessible.

Aeroplane means a power-driven heavier-than-air aircraft deriving its lift in-flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Air operation means an air transport operation or a commercial transport operation.

Air operator means the holder of—

- (1) an air operator certificate granted under section 9 of the Act and in accordance with Part 119; or
 - (2) a foreign air operator certificate granted under section 9 of the Act and in accordance with Part 129; or
- an Australian air operator certificate with ANZA privileges.

Air transport operation means an operation for the carriage of passengers or goods

DEFINITIONS

by air for hire or reward except—

- (1) a commercial transport operation.

Airline transport pilot licence means a licence type held under the requirements set out in Part 61, Subpart F. Minimum age of 21 and minimum of 1500 flight hours.

B-category flight instructor means an instructor with a minimum of 500 flight experience hours, and all other requirements under Part 61, Subpart G.

C-category flight instructor means an instructor with a minimum of 200 flight experience hours, and all other requirements under Part 61, Subpart G.

Civil Aviation Authority of New Zealand means the New Zealand Aviation regulatory body. It monitors rule and safety compliance within the civil aviation industry (non-military operations) as well as conduct investigations into aviation accidents and incidents in conjunction with the Transport Accident Investigation Commission.

Commercial pilot's licence means a licence type held under the requirements set out in Part 61, Subpart E. Minimum age of 18 and minimum of 150 flight hours in an approved training facility or 200 if not in an approved training facility.

Commercial transport operation means an operation for the carriage of passengers or goods by air for hire or reward—

- (1) where—

DEFINITIONS

- (i) each passenger is performing, or undergoing training to perform, a task or duty on the operation, or
- (ii) the passengers or goods are carried to or from a remote aerodrome

Evening civil twilight means when the centre of the setting sun's disc is 6 degrees below the horizon. After such time, night flying rules apply.

General Aviation means all the small airlines and charter operators of 9 seats or less, all helicopter operations, all agricultural operations, and all sport and recreational operations.

Incident means any occurrence, other than an accident, that is associated with the operation of an aircraft and affects or could affect the safety of operation. Incident sub-types include: Aerodrome Incidents, Aircraft Incidents, Airspace Incidents, Bird Incidents, Cargo Security Incidents, Dangerous Goods Incidents, Defect Incidents, Facility Malfunction Incidents, Promulgated Information Incidents and Security Incidents.

Instrument flight rules means the operating of an aeroplane in accordance to Part 91.401-.431, whereby the aeroplane is flown by sole reference to its instruments.

Large aeroplane means an aeroplane having a seating configuration of more than 30 seats, excluding any required crew member seat, or a payload capacity of more than 3410 kg. Must comply with all rules and the rules set forth in Part 119 and 121 if operating as an Air Transport Operation or Commercial Operation.

DEFINITIONS

Maximum all up weight means the maximum amount that an aeroplane can weigh.

This is to allow more fuel to be carried for larger aircraft prior to take-off to be used during taxiing and may be more than MCTOW.

Maximum certificated take-off weight, in relation to an aircraft, means the weight specified as the maximum take-off weight of the aircraft in a flight manual or airworthiness certificate relating to the aircraft at the beginning of the take off roll.

Medium aeroplane means an aeroplane having a seating configuration of 10 to 30 seats, or a payload capacity of 3410kg or less and a MCTOW greater than 5700kg, or to perform a SEIFR passenger operation. Must comply with all rules and the rules set forth in Part 119 and 125 if operating as an Air Transport Operation or Commercial Operation.

Near-miss (also known as a near collision) means an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.

Pilot-in-command, in relation to any aircraft, means the pilot responsible for the operation and safety of the aircraft.

Private pilot's licence means a licence type held under the requirements set out in Part 61, Subpart D. Minimum age of 17 and minimum of 50 flight hours.

Recreational pilots licence means a licence type held under the requirements set out

DEFINITIONS

in Part 61, Subpart H. Minimum age of 17 and minimum flight hours 50.

SEIFR passenger operation means an air transport operation carrying passengers in a single-engine aeroplane under Instrument Flight Rules.

Small aeroplane means aeroplanes having a seating configuration of 9 seats or less, excluding any required crew member seat, and a MCTOW of 5700 kg or less, except when they are used for SEIFR passenger operations. Must comply with all rules and the rules set forth in Part 119 and 135 if operating as an Air Transport Operation or Commercial Operation.

Training organisation means a primary flight training school or aero-club. It allows pilots to be trained in single and multi engine aeroplanes. They must operate under Part 141.

Trainee Pilot means a pilot who is undergoing pilot training at a CAANZ approved training organisation. For the purpose of the current research a pilot who has under 250 hours 'Pilot-in-command' is also considered to be a trainee because of the hours of training it takes to become proficient in aeronautical manoeuvres.

Type rating means except as provided in rule 61.57, a pilot of a New Zealand registered aircraft, or a foreign aircraft operating in New Zealand, must hold a current aircraft type rating for that aircraft.

DEFINITIONS

Visual flight rules means the operating of an aeroplane in accordance to Part 91.301-.315, whereby the aeroplane is flown solely by visual reference.

ABBREVIATIONS

ABBREVIATIONS

ATPL means Airline Transport Pilots Licence.

CAANZ means Civil Aviation Authority of New Zealand.

CAAUK means Civil Aviation Authority of the United Kingdom.

CASA means the Civil Aviation Safety Authority (Australia).

CB means Cumulonimbus.

CPL means Commercial Pilot's Licence.

ECT means Evening Civil Twilight.

FAA means Federal Aviation Authority.

GA means General Aviation.

IFR means Instrument Flight Rules.

MAUW means Maximum All Up Weight.

MCTOW means Maximum Certified Take Off Weight.

PPL means a Private Pilots Licence.

PIC means Pilot-In-Command.

SEIFR means Single Engine Instrument Flight Rules passenger operation.

TCU means Towering Cumulus.

VFR means Visual Flight Rules.