Preventative Measures in Aviation Security: 
A Profiling Approach 

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Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

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(Signature)
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<th>Description</th>
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<tbody>
<tr>
<td>9/11</td>
<td>September 11th 2001</td>
</tr>
<tr>
<td>ACI</td>
<td>Airports Council International</td>
</tr>
<tr>
<td>AIPA</td>
<td>Australian International Pilot’s Association</td>
</tr>
<tr>
<td>ANAO</td>
<td>Australian National Audit Office</td>
</tr>
<tr>
<td>API</td>
<td>Advanced Passenger Information System</td>
</tr>
<tr>
<td>ARSA</td>
<td>Avoidance, Reduction, Sharing, Acceptance</td>
</tr>
<tr>
<td>AS/NZS</td>
<td>Australian Standard/New Zealand Standard</td>
</tr>
<tr>
<td>ASRS</td>
<td>Aviation Self Reporting Scheme</td>
</tr>
<tr>
<td>AVC</td>
<td>Automated Vehicle Clearance (Hong Kong SAR)</td>
</tr>
<tr>
<td>BAA</td>
<td>British Airports Authority</td>
</tr>
<tr>
<td>BRN</td>
<td>Booking Reference Number</td>
</tr>
<tr>
<td>CAPPS</td>
<td>Computer Aided Passenger Prescreening System (United States)</td>
</tr>
<tr>
<td>CASA</td>
<td>Civil Aviation Safety Authority (Australia)</td>
</tr>
<tr>
<td>CBP</td>
<td>Customs and Border Protection (United States)</td>
</tr>
<tr>
<td>CBSA</td>
<td>Canada Border Services Agency (Canada)</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed Circuit Television</td>
</tr>
<tr>
<td>DFAT</td>
<td>Department of Foreign Affairs and Trade (Australia)</td>
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<tr>
<td>DHS</td>
<td>Department of Homeland Security (United States)</td>
</tr>
<tr>
<td>DIAC</td>
<td>Department of Immigration and Citizenship (Australia)</td>
</tr>
<tr>
<td>DVAS</td>
<td>Discrete Visual Analogue Scale</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>EC</td>
<td>European Commission</td>
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<tr>
<td>ECD-GE&amp;T</td>
<td>European Commission Directorate-General Energy and Transport</td>
</tr>
<tr>
<td>EDS</td>
<td>Electronic Data Systems Corporation</td>
</tr>
<tr>
<td>eIACS</td>
<td>Enhanced Immigration Automated Clearance System (Singapore)</td>
</tr>
<tr>
<td>EPIC</td>
<td>Electronic Privacy Information Center (United States)</td>
</tr>
<tr>
<td>ETA</td>
<td>Electronic Travel Authority</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration (United States)</td>
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<tr>
<td>FBI</td>
<td>Federal Bureau of Investigation (United States)</td>
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<tr>
<td>GAO</td>
<td>Government Accountability Office</td>
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<tr>
<td>HKIA</td>
<td>Hong Kong International Airport</td>
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<tr>
<td>IACS</td>
<td>Immigration Automated Clearance System (Singapore)</td>
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<td>ICAO</td>
<td>International Civil Aviation Organization</td>
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<td>IIT</td>
<td>Information Integration Theory</td>
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<tr>
<td>IPP</td>
<td>Information Privacy Principle (Australia)</td>
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<tr>
<td>ISR</td>
<td>Identity Service Repository</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>JCPAA</td>
<td>Joint Committee of Public Accounts and Audit</td>
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<tr>
<td>MAL</td>
<td>Movement Alert List</td>
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<tr>
<td>MRID</td>
<td>Machine Readable Identification</td>
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<tr>
<td>n.d.</td>
<td>No Date</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>NCIP</td>
<td>National Critical Infrastructure Protection Program (Australia)</td>
</tr>
<tr>
<td>NPPC</td>
<td>National Passenger Processing Committee (Australia)</td>
</tr>
<tr>
<td>OTS</td>
<td>Office of Transport Security (Australia)</td>
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<tr>
<td>PMT</td>
<td>Protection Motivation Theory</td>
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<tr>
<td>PNR</td>
<td>Passenger Name Record</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
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<tr>
<td>PPRR</td>
<td>Prevention, Preparedness, Response, Recovery</td>
</tr>
<tr>
<td>R.O.C.</td>
<td>Republic of China</td>
</tr>
<tr>
<td>REPCON</td>
<td>Aviation Confidential Reporting Scheme</td>
</tr>
<tr>
<td>RFID</td>
<td>Radio Frequency Identification</td>
</tr>
<tr>
<td>SARPS</td>
<td>International Standards and Recommended Practices</td>
</tr>
<tr>
<td>SAS</td>
<td>Scandinavian Airline System</td>
</tr>
<tr>
<td>TAFE</td>
<td>New South Wales Technical And Further Education (Australia)</td>
</tr>
<tr>
<td>TRA</td>
<td>Theory of Reasoned Action</td>
</tr>
<tr>
<td>TReDLoG</td>
<td>Department of Infrastructure, Transport, Regional Development and Local Government (Australia)</td>
</tr>
<tr>
<td>TSA</td>
<td>Transportation Security Administration (United States)</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>UNSW</td>
<td>University of New South Wales</td>
</tr>
<tr>
<td>UWS</td>
<td>University of Western Sydney</td>
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</table>
Abstract

Security techniques used by aviation authorities have consisted of methods such as the security screening process, where passengers walk through a metal detector. Whilst this method has succeeded on many levels, the means by which threats to aviation present themselves have expanded and methods of enactment have become more elaborate and sophisticated. While the aviation industry has been successful in meeting this challenge, incidents such as September 11 2001 (9/11), would seem to suggest otherwise. To handle these new, covert and much more deadly threats, the International Civil Aviation Organization, along with other regulatory bodies, has investigated and implemented new, more intense, security measures.

This thesis investigates one of the emerging avenues of increased aviation security, passenger profiling. The application of passenger profiling techniques is growing within the global aviation industry as it is seen to diminish the risk of threats to an aircraft. The purpose of this thesis is to investigate the use of passenger profiling as an approach to aviation security management in Australia and to assess whether or not the travelling public would be accepting of its introduction.

This thesis uses a concurrent mixed-method approach incorporating non-experimental, investigative, observational, inductive and deductive methods. The data was gathered through an extensive literature review on existing profiling programmes used globally, as well as emailed surveys. The data was analysed using a thematic approach, assisted by the use of the SPSS 14.0 data analysis software packages.

This research indicates that there is a mixed reaction to passenger profiling. Respondents are willing to undergo further security checks. However, concerns over the amount of data and information needed to implement a passenger profiling programme and the potential social implications of the general monitoring of people’s movements emerged. Therefore, further research is needed to balance the concerns and issues of passengers with the requirements and obligations of the aviation industry.
Chapter 1: Introduction

The aviation industry has been under violent threats since the 1960s (Office of Transport Security [OTS], 2005). Threats have come in numerous forms, including hijackings such as the Air France hijacking over Algeria in 1994 (Emergency & Disaster Management Inc, n.d.); bombings such as the Pan Am Boeing 747 explosion over Lockerbie, Scotland in 1988 (Patankar & Unsinger, 2003); and in 2002, the attempted missile attack on an EL AL Israeli Boeing 757 in Kenya (OTS, 2005).

An extreme example of a threat to the aviation industry within the past decade (1999-2009) was the terrorist hijacking and subsequent destruction of the World Trade Center in New York in September 2001 (9/11). Since that time, the aviation industry has gone through a fundamental change in its approach to the treatment of potential risks. Aviation security has come under an amplified level of scrutiny (Cavoukian, 2003), which was further enhanced after the attempted hijacking scare at London’s Heathrow airport in August 2006. This resulted in an increase in the level of security measures introduced throughout the aviation industry in an attempt to prevent a reoccurrence of such events. Consequently, authorities investigated stricter measures on passenger security. One option taken by authorities is the adoption of passenger profiling as a preventative security measure (Airports Council International, 2006, March).

Passenger profiling is believed to lessen airline and passenger risk from terrorist activity (Ghobrial & Irvin, 2004). If this is so, using passenger profiling as a way of mitigating threats to the aviation industry could, from an Australian perspective, be a
viable option, as profiling has the potential to identify threats to aviation before they can develop.

From an Australian perspective, Clarke (1993) investigated the various uses of profiling, with a particular concentration on the marketing uses and data surveillance methods used in profiling. Clarke’s (1993) study also discussed the techniques, benefits, negatives, control mechanisms and external constraints on profiling. Today, the accessibility that organisations have to private data about their passengers has increased with the expansion of technology. Easier data access means that profiling can be a quick and potentially effective identification tool.

Following the Heathrow hijacking scare, there has been a stronger call for the introduction of passenger profiling in Australia (McIlveen, 2006, 29 August). The situation at Heathrow focussed the public’s attention on the vulnerability of the aviation industry to threat. This hijacking scare brought the option of profiling as a means to mitigate the threat of future hijackings into the public eye.

1.1 Objectives
This thesis is an investigative study that examines the increase in aviation security levels at airports and whether or not new measures such as passenger profiling, would be acceptable by the travelling public. This is investigated by asking the question “Will passengers accept passenger profiling, in its various forms, as a further way for authorities to increase aviation security?”. One aim of the research is to fill a gap in the knowledge bank by investigating the use of passenger profiling as an approach to aviation security management. This is an important area of
research as passenger profiling for aviation security is a growing field of application within the global aviation industry as a means of reducing the risk of unlawful interference with an aircraft or associated infrastructure.

1.2 Justification

Passenger profiling, in some form, is currently being used by various national governments as a means of increased security (Accenture, 2007; Angkasa Pura Schiphol, 2005; Canada Border Services Agency, 2007a; 2008a; Cavoukian, 2003; Dubai eGovernment, 2009; Electronic Data Systems Corporation, 2007a; European Communities, 2009; 2005; Ghobrial & Irvin, 2004; Government Accountability Office [GAO], 2005, Home Office, n.d.; Hong Kong Trade Development Council, 2004; Immigration & Checkpoints Authority, 2009; Matthews, 2002; Poole & Passantino, 2003; Soghoian, 2008; Transportation Security Administration [TSA], 2004a; U.S. State Department, 2004). In order to maintain regional co-dependence, and with the importance of international co-operation within the aviation industry being imperative to commercial success, it is very important that an Australian perspective be investigated on such a significant issue.

The justification for this research is primarily based on the grounds that, at the time of completion (2009), an academic investigation into passenger profiling in Australian aviation had not yet been done. As the globalisation of the aviation industry brings with it regional co-dependence on many levels including security, the need to investigate passenger profiling as a method of security management in Australia is required. This thesis adds to the body of scholarly knowledge by incorporating passenger perspectives on the use of security profiling. Passengers
where chosen due to the lack of industry knowledge regarding passenger perception of security profiling.

1.3 Limitations
Firstly, this research was confined to the passenger perspective of aviation security and is primarily concerned with the passenger perception of the use of passenger profiling within international aviation operations. This research does not investigate domestic operations. This is because an airline’s or airport’s security need does not differentiate between international and domestic operations. Additionally, while acknowledging the possible requirement for employee profiling to be done at the job interview stage, this thesis does not concentrate on this aspect.

Secondly, gaining access to research respondents proved to be difficult due to the very nature of the topic. This is a limitation because of the guarded nature by which those in the security industry scrutinise requests for information and access, which impeded the progress of the research as requests for information and access to respondents was not met with great eagerness. Consequently, the research sample primarily came from confined sources. The majority of respondents to the research were sourced from three post-secondary educational institutions located within Sydney Australia. Therefore, most of the respondents were aged less than 30 years old. In addition, the sample size of 256 limits the applicability of the results, the reasoning behind such a restricted sample size and the age of the respondents is discussed in Chapter 4: Methodology.
1.4 Thesis Structure

Chapter 2: Literature Review examines the ways in which passenger profiling is being used as an avenue of increased security within the global aviation industry. The second half of the chapter examines Australia’s approach to aviation security and the initiatives being undertaken relating to increased aviation security measures. This chapter relates to the first part of the research question, that of passenger acceptance of profiling. It is proposed that examining the reaction by passengers to passenger profiling in other countries can give an indication as to what the reaction may be by the passengers here in Australia.

Chapter 3: Theoretical Framework examines the theories that have been used in this thesis. The theoretical base comes from risk management, with minor inclusions of criminology and decision-making.

Chapter 4: Methodology outlines the research methodology that has been used, delineating the approaches taken and the theoretical underpinnings while also discussing the method undertaken to capture data including the avenue of data collection, the development of the survey and an outline of how the results are analysed.

Chapter 5: Results examines the data and respondent comments taken from the research survey. The data has been examined using a combination of cross-tabulations and frequency tables using version 14.0 of the Statistical Package for the Social Sciences software solution. The respondent comments have been textually
analysed using a thematic approach grouped into five areas, general questions, registered traveller schemes, profiling, complacency and observations.

Chapter 6: Discussion examines the results obtained in Chapter 5: Results with that of the literature. Chapter 6 investigates the general literature, registered traveller programmes, vulnerabilities, perceptions and privacy issues that emerged in both the literature and the data gathering process. From the literature and the survey responses, the predominant areas that concern passengers and industry regarding the use of passenger profiling have been the proliferation of registered traveller programmes and the introduction of biometric identification methods at airports.

Chapter 7: Conclusion summarises the thesis and offers areas of future research.

1.5 Profiling Definitions
Profiling is simply a means of building up a database of common characteristics displayed by people (Australian Customs Service, 2007b; Blau, 1994; Douglas, Ressler, Burgess & Hartman, 1986; Douglas & Olshaker, 1995; Petherick, 2003; Torres, Boccaccini & Miller, 2006; Wilson, Lincoln & Kocsis, 1997). The Australian Customs Service (2007b) considers profiling as a process of filtering multiple indicators that represent the characteristics of a high-risk passenger.

Within law enforcement, profiling can be described as the process of using behavioural evidence to infer future actions of offenders including the personality characteristics and psychopathology of the perpetrators (Torres, Boccaccini & Miller, 2006). This is termed behavioural evidence analysis and is one method out of many
that can be used to describe criminal profiling according to Petherick (2005). This is similar to the description that Homant and Kennedy (1998) gave to profiling, stating that profiling assumes offenders have consistent behavioural traits that can be identified and captured for future apprehension.

In addition, Blau (1994) indicates that the aim of profiling is to derive likely characteristics from the way in which a particular crime was committed which can then be used to, potentially, identify the perpetrator. Curry (2004) surmises that profiling is an attempt to divide a population into groups. The group is defined not of a set of significant attributes, but by its propensity to engage in certain activities. Therefore, when considering Blau’s (1994) and Curry’s (2004) comments in unison, profiling could be seen as an instrument of division within a given population.

Wilson, Lincoln and Kocsis (1997) describe profiling as analysing crime behaviours to predict the probable characteristics of the offender. In addition, Douglas, Ressler, Burgess, and Hartman (1986) described profiling as “a technique for identifying the major personality and behavioral [sic] characteristics of an individual based upon an analysis of the crimes he or she has committed” (p. 405). These two definitions are based on an offender’s behavioural characteristics. From an aviation perspective, rather than focusing on the crime behaviour, profiling could focus on the background characteristics of the passenger. However, even though a passenger’s background characteristics may illustrate a potential chance of hostility, the use of characteristics as an accurate measure of prediction is not absolute.
There are also definitions that focus on the personality of the potential offender. According to Pinizzotto and Finkel (1990), profiling “focuses attention on individuals with personality traits that parallel traits of others who have committed similar offences” (p. 216). Turvey (1999) referred to profiling as the “process of inferring distinctive personality characteristics of individuals responsible for committing criminal acts” (p. 1). Douglas and Olshaker (1995) consider the ultimate goal of profiling is to narrow the scope of a suspect pool rather than to identify a single guilty individual.

There are two basic assumptions that underpin the majority of profiling definitions mentioned above. The first of these is the action of any given offender is consistent across offences due to similar behavioural conditions. The second assumption is that similar offence styles are associated with similar background characteristics. For example, aggressive individuals are aggressive both in their criminal behaviour and in the way they act in other situations. These assumptions are the conditions for the use of criminological profiling to be valid (Alison, Bennell, Mokros, & Ormerod, 2002).

Alison, Bennell, Mokros and Ormerod’s (2002) research is consistent with Douglas and Olshaker’s (1995) claim that profiling is used to condense the potential suspect pool. Additionally, exploring for behavioural consistency will correspond with Douglas and Olshaker’s (1995) definition. Through the use of behavioural markers, authorities discard the majority and thus target a select band of people whom they consider ‘fit the bill’. For the purposes of behavioural consistency, the use of
passenger profiling from an aviation perspective thus strengthens the concept that
behavioural consistency is a firm indicator of future action.

There are many ways to describe the practice of profiling. Through the many and
varied definitions, the researcher has chosen to provide his and Watson’s (2009)
definition. Therefore, for the purposes of this research, profiling shall be defined as:
‘the analysis of a passenger’s past actions via information gained by a governing
authority, to infer current and future behavioural inclination, upon which appropriate
preventative action can be taken’ (Glampedakis & Watson, 2009).

1.6 Profiling Background

1.6.1. Social

There are many different types of profiling used in society, ranging from
employment to marketing, banking, and telecommunications. This examination of
profiling in areas other than aviation contributes to the thesis by illustrating the many
uses of profiling outside of aviation, thereby presenting a case that the use of
profiling in aviation is merely another direction by which profiling is being expanded
upon within the community.

From an organisational perspective, profiling can increase the cohesiveness of the
workplace by having employees whom share the organisational philosophy and
direction. This can be accomplished as part of the initial interview process where the
Person-Organisation fit can be ascertained (Harris, 1999). The Person-Organisation
fit has been described as the underlying similarity between the values of the person
and the organisation (Human Assets, n.d.). Having a successful Person-Organisation
fit can increase work capacity and harmony, which has the possibility of leading to increased profits and greater worker satisfaction.

An example of how potential job applicants go through the Person-Organisation fit is the use of selection criteria in the application process. Job selection criteria are used by organisations to limit the potential applicant pool to a manageable size containing only those that fit the measurements of the organisation (Chandler Macleod, n.d.). The word criteria could easily be substituted with characteristics in which case the linkage to profiling is more solid when considered in terms of the various definitions given in point 1.5. Similarly, job specifications could be considered a method of profiling employees as they all need to fit a ‘mould’ that the organisation has created in order to maintain organisational cohesion. One possible negative element to this is that management could potentially only employ those that will not question or strive to improve the organisation by means of their own initiative (Glambekakis & Watson, 2005).

In addition to employee profiling, consumer profiling is also commonplace. Consumer profiling is being accomplished with increasing ease due to the sophisticated data mining techniques used by large organisations. The predominant areas that use consumer profiles are marketing, finance, and aligned with aviation, frequent flyer programmes.

Consumer financial profiles are being utilised more frequently as a way for organisations to monitor their client’s habits with e-commerce and internet transactions. This has been assisted by the proliferation of ‘smart’ technology
allowing the financial institution to track consumer transactions and thus movements. This may be interpreted as another form of covert profiling. An example of such ‘smart’ technology includes micro-chipped credit cards. The justification for the use of such techniques is towards the notion of ‘tailoring’ services, rather than security. However, consumer profiling in e-commerce could possibly be more than just mere financial tailoring.

Similarly, there is consumer profiling in store cards. Tesco, a large supermarket chain in the United Kingdom, uses personal data held by their database called Crucible. This database accesses their Clubcard loyalty scheme to monitor members' shopping habits and build a profile of them (Tomlinson & Evans, 2005). This Tesco profile classifies consumers across 10 categories: wealth, promotions, travel, charities, green, time poor, credit, living style, creature of habit and adventurous. Clubcard members carry a household reference number to identify them, which holds information relating to the date of their last visit, store locations that have been visited in the past and whether store vouchers have been used (Tomlinson & Evans, 2005). The Clubcard profile used by Tesco is gathered by a subsidiary called Zodiac, which data mines, and on sells, information to a range of companies such as the large telecommunications carrier Orange and the razor company Gillette (Tomlinson & Evans, 2005).

A further example of where profiling is being used openly and without restraint, is in frequent flyer programmes. Upon an individual’s acceptance into the programme, profiles are developed from the personal details of each passenger. The information given to the airline allows it, like in the financial sector, to tailor services such as
holidays and car hire to the new passenger. This tailoring allows an airline to segment the market and promote relevant information and incentives to the members of the frequent flyer programme (Gilbert, 1996).

Therefore, as discussed, profiling in general society is widespread from consumer spending to finance to frequent flyer programmes. The use of profiling within aviation may then be seen as a natural extension from these backgrounds into security management. In addition to social settings, profiling has much of its roots in law enforcement.

1.6.2. Law Enforcement
Profiling has also been frequently used in the law enforcement domain. Many authorities apply preventative and post-event profiling in law enforcement (Office of Technology Assessment, 1986). Preventative profiling is a pre-emptive measure to avert an action or situation. This differs from post-event profiling, which is reactive in nature and therefore does not forestall crises, but deals with their consequences. Moreover, both styles of profiling, preventative and post-event are often done without notification (Electronic Privacy Information Center [EPIC], 2004).

Most of the developments in post-event profiling have been its use in law enforcement investigations (Kocsis & Heller, 2004). In some countries, profiling is purely based on racial factors and is referred to as racial profiling. For example, a study by Ramirez, McDevitt and Farrell (2000) regarding law enforcement profiling discovered that police in Great Britain had been profiling suspects according to race using the following criteria: White-skinned European appearance, [Anglo-Celtic,
13

Germanic, Scandinavian, Russio-Slavic]; Dark-skinned European appearance, [Mediterranean, Turkish]; Black; and Asian.

However, racial profiling is more prevalent in the United States of America (USA) (Siggins, 2002). This classification measure relates to the inherent need by some authorities for exacting descriptors as a means of easier identification when using profiling. However, in terms of this research, it would best be utilised as a pre-emptive behavioural security tool. As seen in the example in the previous paragraph, law enforcement in Great Britain has used profiling as a means of identifying suspects. The need to classify could lead to potential suspects being overlooked because they do not adhere to the selected criteria. This is a major disadvantage with the profiling system used in Ramirez, McDevitt and Farrell’s (2000) research in the above paragraph and poses a serious deficiency for its application elsewhere.

An additional flaw is the lack of scientific research evaluating the validity of profiling as a technique. Oleson (1996) and Wilson, Lincoln and Kocsis (1997) revealed that despite this, profiling continues to be applied by authorities. Although a handful of studies have served to redress the problem of validity within profiling (Kocsis, Hayes, & Irwin, 2002; Pinizzotto & Finkel, 1990). Criminologists, psychologists and law enforcement officials are now beginning to use statistical research methods common in psychology to address this issue (Winerman, 2004). Nonetheless, profiling as a method of identifying potential criminals is still considered by some parts of society as ‘voodoo science’ (Grezlak, 1999, p. 3).
The viewpoint of profiling as ‘voodoo science’ is particularly prevalent in the USA. There are examples in legal cases from the USA where the prosecution used profiling as a means of capturing the criminal and the profiling testimony had been found inadmissible due to community non-acceptance of profiling (Grezlak, 1999). It was found that testimonial accounts are more likely to be admitted into court when profiling is called something other than profiling (Risinger & Loop, 2002). Examples of these descriptors include the United States’ Federal Bureau of Investigation’s (FBI) criminal investigative analysis (Douglas & Burgess, 1986), behavioural evidence analysis (Turvey, 2002), investigative psychology (Canter, 1995), and geographic profiling (Rossmo, 1999). This is an important point for aviation security. Perception of the word profiling can have negative connotations. As such, alternate names can be used to avoid disapproval.

A further approach focuses on the reliability and accuracy of professional criminal profilers used by law enforcement agencies such as the FBI (Ressler & Burgess, 1985, cited in Homant & Kennedy, 1998). Homant and Kennedy’s (1998) research brings to light whether or not profiling, as a form of identification, has a future. Profiling studies have examined the scientific merit of specific profiling approaches. The relevance of these approaches to this research is pointed toward the molar approach. If crimes are committed based on consistent behaviour, then it may be possible to reduce the act of crime by modifying the perpetrators behaviour in some way. Behaviour modification could be achieved by increasing the punishment of the crime itself and the chances of being caught. The use of passenger profiling can assist authorities in achieving both of these points. The next part of this chapter discusses profiling from an aviation perspective.
1.6.3. Aviation

Authorities have attempted to improve security levels within the aviation industry through various means over time. Whilst the maintenance of a secure industry has always been a high priority, there has been a renewed focus on aviation security since the events of September 11 2001 (9/11). The ramifications of that event caused great upheaval within the industry as the International Civil Aviation Organization (ICAO), which regulates all international air travel, stipulated that aviation security must be enhanced throughout the industry in order to reduce the possibility of repeated attempts to emulate this event.

ICAO’s response to 9/11 illustrates the reactive nature of the aviation community (Kunreuther, 2002; Patankar & Unsinger, 2003). Reactive actions refer to instances where incidents or accidents unfold, thus highlighting deficiencies within a safety network or system, before they are corrected; that is, responding to an accident rather than foreseeing one (Pariés, 1996). Szyliowicz (2004) contends that the United States’ Federal Aviation Administration (FAA) was reactive rather than proactive in dealing with security issues prior to 9/11.

Proactive safety actively encourages the prevention of failure before accidents and incidents occur; thereby reducing costs and complications, and assisting in designing improved safety processes. Proactive interventions are a defining characteristic of an effective safety culture (Dunn, 2003; Helmreich, in press). In terms of this research, proactive safety and security relate to the increase in funding for, and exploration of, new measures to counter pre-flight, mid-flight, mid-air and post-flight threats to aviation (Ghobrial & Irvin, 2004; Hainmüller & Lemnitzer, 2003; Salter, 2004).
These measures have included a push for stricter security levels and awareness at
domestic, and more importantly, international airports. Passenger profiling could be
considered a further demonstration of the proactive stance taken by the aviation
industry in relation to increased security.

From an aviation perspective, Annexure 17 of the Chicago Convention outlines the
requirements for all contracting ICAO States, to which Australia is part, to have in
place a civil aviation security programme. Under Annex 17, each contracting State
needs to ensure the safety of passengers, crew, ground personnel and the general
public as a primary consideration when implementing a safety and security
programme (ICAO, n.d.). ICAO’s requirement may be seen as the reason why some
countries have instituted passenger profiling systems, in order to ensure the safety of
passengers, crew, ground personnel and the public. Current examples of passenger
profiling systems are examined as part of Chapter 2: Literature Review.

One of the more widely used options when increasing security measures within the
aviation industry since 9/11 has been the use of armed Air Marshalls, or Sky
Marshalls on aircraft. Air Marshalls, as stated by the Transportation Security
Administration (TSA) in the USA, are law enforcement officers responsible for
protecting air passengers and crew in the event of an attempted hijacking while in the
air (TSA, n.d.c). Air Marshalls have been used most prominently by the Israeli
airline EL AL, and by airlines in the United States and Germany (Clark, 2002;
Federal Ministry of the Interior, n.d.; TSA, n.d.c.). Whilst there has been some
concern over the safety of the aircraft with having armed guards on board, Air
Marshalls are now the primary law enforcement entity within the Transportation Security Administration (TSA, n.d.c).

The acceptance of Air Marshalls in the USA is in contrast to the European Union (EU). In the EU, the use of Air Marshalls has been abandoned by a host of European countries (European Cockpit Association, 2006). The argument for not using Air Marshalls has been that the increased levels of security prior to boarding, negates the requirement for having armed officers on board the aeroplane (European Cockpit Association, 2006). This is in concert with ICAO (2004), who noted that even with the introduction of Air Marshalls, air security cannot be guaranteed. This may be because, with Air Marshalls being covert, passenger intervention in any possible incident may negate any positive influence that Marshalls may have. Another approach to aviation security is the use of passenger profiling.

1.7. Passenger Profiling

From an aviation perspective, profiling systems are based on information gathered about a passenger’s travel and general background for the purposes of increasing the security level of the airline.

Today, identification cards with embedded chips are becoming the norm and biometric technologies featuring facial, fingerprint or retinal recognition are finding increased use.
Suparno Banerjee - EDS Vice President, Global Government Industry (Banerjee, 2007, p. 3)

Banerjee’s (2007) quote above highlights the increased application of and research into the use of identity cards as a technique of identity management. The proliferation of identity cards within society as a means of personal identification is growing. In the United States, legislation has established that digital identity
credentials will be required for citizens to board airliners or gain entry to federal government buildings (Hutchens, 2007a). This increased application of identity management (Electronic Data Systems Corporation [EDS], 2007a; 2007b) may be referred to as a way for organisations to monitor individuals while in the workplace via the use of swipe card access to restricted areas. It could be argued that passenger profiling is a means of identity management. EDS is a major competitor in the global identity management field, and Banerjee’s (2007) quote highlights that the way in which improved identity management, and potentially profiling, can be accomplished. That is, using biometric, facial and fingerprint technology. Each of these points are examined as part of Chapter 2: Literature Review.

An important characteristic of profiling is its covert nature. Because of this, profiling has a greater potential to reduce the risk than other more overt forms of identification like passenger screening. This risk reduction potential is highlighted by the notion that profiling is done away from the view of the public and can be used to single out potential criminals without their knowledge. This veiled ability is its greatest strength.

Passenger profiling also has the potential to enhance border security. This is because matching passenger details between their Passenger Name Record (PNR) data and national immigration authorities can speed up the customs and immigration clearance process at border control. This inter-connectivity aspect of passenger profiling has the ability to reduce the chances for would-be criminals to cause an incident.
Profiling is not screening. Passenger screening is when passengers proceed past check-in and are stopped by guards at a security screening point upon which passengers pass through metal detectors (Joint Committee of Public Accounts and Audit [JCPAA], 2004). Even though profiling techniques such as the CAPPS II programme in the USA reveals information that screeners may otherwise not discern, its use does not discount the need for a face-to-face screener. This is because characteristics such as nervousness or hidden contraband are only detected by a perceptive screener (Persico & Todd, 2005). Because of this, profiling and screening need to complement each other and thus make the environment more difficult for any prospective criminal.

According to Viscusi and Zeckhauser (2005), the FBI have developed a profiling technique that takes into account the person’s age, race, gender, national origin, appearance, and baggage. In addition, the FBI has incorporated terrorist risk profiling into their assessments. Targeted screening based on these risk profiles, could reduce the security risk by as much as random searches, but may involve a further time delay for passengers. This is an example of how profiling and screening can work in cohesion. The Airports Council International (2006, March) noted that the introduction of passenger profiling techniques (including registered traveller programmes) is their preferred method of increasing aviation security.

However, if profiling focuses on one particular group over another, even if they do not actually constitute a credible risk, then using profiling can create an undercurrent of mistrust between the profilers and the profiled (O’Malley, 2006). This can then lead to discrimination between the two, which can cause further misgivings and can
thus turn that minority into a majority due to this discrimination. Alberto and Bogatz (n.d.), found that focusing only on those people who ‘fit’ a specific profile of people who may cause harm ignores the possibility that someone who does not fit the profile may be engaged in, or be an accomplice to, causing harm. In order to circumvent these concerns, any form of profiling system should be based on behavioural inclination and expectation, rather than racial parameters.

As with any new process to be used in the public domain, there will always be issues that need addressing before the new process can be introduced and accepted by the public. The subsequent paragraphs examine concerns that have been raised in countries that currently employ passenger profiling systems. Concerns include the various vulnerabilities of passenger profiling, as well as the perceptions that the public have regarding profiling. These concerns are examined in Chapter 6: Discussion on pages 128-143.

1.8 Summary
While there is great discussion and debate over what defines profiling, its use within aviation security, for better or worse, is being adopted with great eagerness by governments who need to be seen to be actively engaging in risk minimisation strategies. Chapter 2: Literature Review examines the more widely used methods of implementing a passenger profiling programme.
Chapter 2: Literature Review

The literature review was a process of examining numerous documents from academia, research and the aviation industry regarding the topic of passenger profiling. The first part of this chapter examines the various ways and means that passenger profiling systems may be implemented. The three most popular ways of integrating a passenger profiling system into aviation security programmes include the use of PNR data, frequent traveller programmes and the increasing use of biometrics. Examples are taken from North America (CAPPS, CAPPS II, Secure Flight, Registered Traveler Program, US-VISIT and NEXUS); Europe (Precise BioFlight, e-pass, IRIS and miSense); the Middle East (Express Entry and eGate) and Asia (eChannel, Immigration Automated Clearance System).

The second part of this chapter is an examination of how a passenger profiling system could be developed and integrated into the Australian aviation industry. An understanding of the Australian aviation system, including the current administrative and legislative requirements of the industry is important as the research question relates specifically to the Australian situation. This examination includes exploring four border security initiatives undertaken by the Australian federal government.

Regarding the research question, ‘Will passengers accept passenger profiling in its various forms, as a further way for authorities to increase aviation security?’ This chapter relates to the first part of the research question, that of passenger acceptance of profiling. Examining the reaction of the travelling public to passenger profiling in other countries can give an indication of Australian passenger reactions.
2.1. Passenger Name Record Access

There are many ways to implement a passenger profiling programme. One of these is through accessing PNR data. The use of PNR data is one of the least intrusive methods of information gathering. The PNR comprises passenger name, address, telephone number, flight number, method of payment and itinerary (Swartz, 2004a). In the USA, information that may reveal religious or racial status such as meal orders and health status are not included (Department of Homeland Security [DHS], 2004, p. 2; EU and U.S. agree..., 2004). On electronic tickets, the PNR can also be referred to as the Booking Reference Number.

Passenger-profiling programmes based on PNR data are the preferred option for many countries (Council of the European Union, 2007; Government Accountability Office [GAO], 2005; Transportation Security Administration [TSA], 2004a). For example, Denmark and Spain have considered implementing a PNR based profiling system within their aviation security framework (‘Travellers to Europe...’, 2008). However, the proposal for the introduction of an integrated PNR profiling system across all external EU borders is preferred (Republic of Slovenia, 2008). Examples of PNR systems, sourced from the USA are discussed below.

2.1.1. CAPPS

The Computer Assisted Passenger Prescreening System (CAPPS) was pioneered by Northwest Airlines and had been adopted by most domestic USA airlines by 1997 (Curry, 2004). CAPPS used data contained in a passenger’s PNR and sought to match patterns between a passenger’s PNR data and their intended travel itinerary. If the CAPPS data matched a particular profile, the record was flagged and the
passenger was further screened by airport security staff (Cavoukian, 2003). The data used for the CAPPS programme were age, sex, method of payment, place and time of payment, boarding sequence, seat selection, whether the passenger was accompanied or not and whether they had checked or unchecked baggage (Curry, 2004).

Two concerns with CAPPS were that while not being invasive, the accessing of this data was an area of concern for passengers as the safeguards on the use of private information proved to be insufficient (Cavoukian, 2003; Swartz, 2004b). Also, while CAPPS could inform authorities of a passenger’s travel pattern, there was no mechanism for a more detailed evaluation (Cavoukian, 2003). CAPPS was replaced by the Computer Assisted Passenger Prescreening System II (CAPPS II).

2.1.2. CAPPS II

Like the CAPPS programme, CAPPS II used passenger information collected by the travel agent upon reservation. However, unlike CAPPS, the newer CAPPS II system checked passenger information against both government and commercial databases to determine the level of security screening per passenger (Ghobrial & Irvin, 2004; GAO, 2005, Matthews, 2002; Soghoian, 2008).

The CAPPS II programme met with resistance from the public who felt that they are being targeted for no reason other than their race, colour, or religion, even though the programme did not specifically target these areas when assessing passenger risk (Subcommittee on Aviation, 2002). With CAPPS II using multiple outsourced databases, there was greater potential for privacy access issues and for information to be used in a manner other than that for which it was intended. For example,
passengers may be held for no apparent reason other than it was inferred from sources that they might be a threat (Glater, 2003, June). Therefore, the possibility of a passenger being withheld by authorities with no grounding remained. For example, following the 9/11 attack, many Arab Americans were refused entry onto aircraft even after they were cleared by security (Alberto & Bogatz, n.d.). This highlights the point of public resistance to the programme. CAPPS II did not proceed past the trial stages for these reasons (Soghoian, 2008).

2.1.3. Secure Flight
The ‘Secure Flight’ programme was developed after concerns over data security led to the cessation of CAPPS II (Swartz, 2004a). ‘Secure Flight’ has been marred by repeated concerns that it is nothing more than a reworking of the older CAPPS II (Hughes, 2004). These concerns were because ‘Secure Flight’ requests airlines to forward a greater amount of information about their passengers to authorities than under CAPPS II (GAO, 2005; Swartz, 2004a; Transportation Security Administration, 2004a). Secure Flight’s introduction has been delayed until 2010 due to serious flaws in its original deployment (GAO, 2006) and over repeated security breaches of information access (EPIC, 2008; Hawley, 2006). If using the PNR system is not an option, then other alternates include using a frequent traveller programme.

2.2. Registered Traveller Programmes
Registered traveller programmes are a further way of implementing a passenger profiling system. Using a registered traveller programme can be accomplished through accessing the frequent flyer data that is held by airlines. Using this option,
there is no further intrusion into the lives of passengers. Additionally, using airline alliances as a source of data for a registered traveller programme could enhance regional interoperability.

Registered traveller programmes have the added advantage of potential interoperability amongst nations. This is because as the data is already within an airline’s frequent flyer database, it can allow passengers to have a seamless transfer between interlining carriers within the same alliance. This could be accomplished if security clearance requirements were accepted amongst a group of countries with similar security level standards. Examples are sourced from the USA (Creedy, 2007; DHS, 2006; European Commission Directorate-General Energy & Transport, 2007; Salter, 2004; U.S. State Department, 2004), where a number of frequent traveller programmes have been tried with varied levels of success. These are now discussed.

2.2.1. Registered Traveler
Testing of the Registered Traveler scheme in the USA commenced in January 2006 (DHS, 2006). Registered Traveler separates passengers and their luggage into three categories: low, medium and high-risk registered travellers. Passengers identified as medium and high risk underwent stricter security checks every time they presented at an airport. Low-risk travellers would choose to undergo in-depth background investigations in exchange for shorter security checkpoint lines (EDS, 2007b). The trial of this programme was conducted at various airports attracting over 10,000 participants (EDS, 2007b).
Participants in the registered traveller scheme supplied authorities with iris images and electronic fingerprints (TSA, n.d.b). Once registered, this information was submitted to the TSA, where a security threat assessment was performed. Registered travellers would thence be ‘known’ to authorities and not subjected to secondary searches (EDS, 2007b; TSA, 2004b). The passenger’s biometric identifiers are used to verify their identities at security kiosks, once completed, they are then processed through the normal baggage security screening. Therefore, passengers who once spent significant time in security lines could speed through the procedure in a few minutes with automatic identity verification (Ghobrial & Irvin, 2004; Hewlett-Packard Development Company, 2008) thus having the double benefit of reducing passenger waiting times and increasing security (EDS, 2007b).

In 2008 the ownership and licensing of Registered Traveler was transferred to the private sector and in June 2009 Verified Identity Pass Inc, which had the largest share of the registered traveller market withdrew its traveller scheme, ‘Clear’, from operation due to financial difficulties (Frank, 2009). Consequently, the Air Transport Association in the USA does not consider registered traveller schemes to have any future (Frank, 2009). Organisations still operating registered traveller schemes are currently considering their own crediting options (Jonas, 2009).

Registered Traveller programmes can provide an overall enhancement to aviation security. Applicants for the programme must provide biometric information, which is then verified and authenticated to safeguard against the use of a false or stolen identity. In addition, all applicants must confirm their identity using biometrics such
as fingerprints or iris scans (DHS, 2006). However, as the programme is currently in a state of flux, there are other programmes such as the US-VISIT programme.

### 2.2.2. US-VISIT

The U.S. Visitor and Immigrant Status Indicator Technology (US-VISIT) programme in the USA tracks the entry and exit of foreign visitors by using electronically scanned fingerprints and photographs (Creedy, 2007; European Commission Directorate-General Energy & Transport, 2007; Salter, 2004; U.S. State Department, 2004). The biometric information within the passports of those foreign nationals is then checked against a watch-list. By December 2005, the US-VISIT programme had been installed at over 115 airports across the United States (EPIC, 2007).

The USA Department of Homeland Security envisage that the US-VISIT programme will assist in alleviating the prevalence of passport and identity fraud at the time of border crossing. It will additionally enhance the security of USA citizens and visitors, facilitate legitimate travel and trade, ensure the integrity of the USA immigration system and protect the privacy of visitors (DHS, 2008a; 2008b). Other ways that passenger profiling systems are being applied are through the use of biometric identifiers.

### 2.3. Biometrics

Since 9/11, airports around the world have had to step up security screening and security systems as well as install hi-tech devices that use iris, fingerprint recognition and other forms of biometric technologies to prevent terrorists and criminals from boarding aircraft and entering the countries (Narita International Airport
Corporation, 2006). Biometrics is the analysis of biological data such as a fingerprint, voice, face or features of the eye's iris to confirm an individual’s identity (ComSec Enterprises, 2007). As organisations become more security-conscious, the frequency with which biometric-based solutions are used as an avenue of security is expected to increase. Governments and airports around the world are implementing biometric identification as a means to increase security and safety for travellers and citizens (NEC Corporation, n.d.).

For example, the use of biometrics in aviation is primarily through the storing of biometric features on a computer chip, which can then be automatically checked against the features of the passenger when undergoing border controls. Biometrics enhances passport security in two different ways. First, the microchip is a further obstacle to identification forgery as it is unique for everyone. Second, the chip enhances protection against the misuse of passports by giving authorities the ability to digitally reference the person presenting the passport is the same person to whom the passport was originally issued (Federal Ministry of the Interior, 2005).

Major developments in biometrics have occurred in Australia (see point 2.5.3. Border Security Initiatives on page 44 for more detail). Additionally in the United Kingdom (UK), where, electronic screening and biometric visas are being introduced for all foreign nationals (Tighter checks looming..., 2007). Other biometric options include the use of iris scans to identify passengers. Biometric systems that scan a passenger’s iris are being trialled at Charles de Gaulle airport in Paris and at Frankfurt airport (McGroarty, 2008, February 4).
The predominant means by which biometrics is improving security is through automated entry procedures at airports; this is done mostly through biometric features stored in passports. Biometric passports are a means of identifying non-citizens at the border. Using biometric features stored in passports is gaining momentum as a method of passenger profiling. The following discusses examples of biometric automated entry processes including the German “e-pass”, Canadian/USA NEXUS border crossing process, the UK IRIS system, the Singaporean Immigration Automated Clearance System and eGate from the United Arab Emirates.

2.3.1. e-pass
In Europe, examples of the successful implementation of biometric identification include Germany, where in 2005 they introduced an “e-pass” passport. This passport holds biometric information via two digital fingerprints, as well as features such as eye colour, height and facial image (Federal Ministry of the Interior, 2005). The “e-pass” is expected to ease passenger flow at immigration controls in Germany due to passengers only needing to swipe their passports. The biometric features stored in the chip can be automatically matched with the person presenting the e-pass. The picture taken at the inspection point must match the image stored in the e-pass (Federal Ministry of the Interior, 2005).

2.3.2. NEXUS
NEXUS is one of two main border control mechanisms that run concurrently between the United States and Canada. NEXUS is a joint operation between the Canada Border Services Agency (CBSA) and United States Customs and Border Protection (CBP) in order to expedite the border clearance process for low-risk, pre-
approved travellers into Canada and the United States while enhancing security (CBSA, 2007a; 2008a). The NEXUS system is a biometric system using iris recognition technology and is used at Vancouver, Toronto, Ottawa, Montréal, Halifax, Calgary, Winnipeg and Edmonton (CBSA, 2008b).

2.3.3. IRIS
The IRIS system from the UK allows registered passengers to enter the UK through automated barriers at certain airports. It makes use of the fact that the pattern of the iris in each person's eye (the coloured part of the eye) is unique. The passenger is identified simply by looking into a special camera. The IRIS system uses a photograph of the iris pattern, converts it into a digital code and then compares it with others stored in a secure database. When it matches the captured iris pattern with the corresponding one on the database and the registration is still valid, that person can enter the UK by passing through the IRIS barrier located in the immigration arrival hall. This system operates at Heathrow, Gatwick, Manchester and Birmingham airports (Home Office, n.d.).

2.3.4. Immigration Automated Clearance System
The Singaporean Immigration Automated Clearance System (IACS) programme commenced in 1997 (Yan, 2007). The IACS programme was introduced to improve the efficiency of immigration clearance at checkpoints through using biometric fingerprint and smart card technologies. The system allows frequent passengers to have an express clearance through immigration (Immigration & Checkpoints Authority, 2009). The IACS is available at Changi Airport, Singapore Cruise Centre,
Tanah Merah Ferry Terminal and numerous bus terminals. Figure 2.1 below shows the Singaporean IACS system.

![Figure 2.1: The Immigration Automated Clearance System in Singapore](Source: NEC Corporation, n.d.)

Between 2006 and 2008 the IACS programme was revamped into the Enhanced Immigration Automated Clearance System (eIACS) which allowed Singaporean citizens to clear immigration using only their passports. Singaporean citizens who already had their identity cards and their fingerprints, had been registered and stored in the Singapore National Registration database, and have valid machine-readable passports are eligible to use the eIACS (Immigration & Checkpoints Authority, 2009). With the Singaporean eIACS, if a passport number or thumbprint does not match that which is stored within the database at the security gates, the security services can be automatically alerted (NEC Corporation, n.d.).

### 2.3.5. eGate

A further biometric system is eGate from the United Arab Emirates. The eGate facility is an advanced passenger clearance system designed to improve passenger traffic flow through electronic screening of passenger data with the help of a smart
card (Department of Civil Aviation, 2007). Using fingerprint biometrics, all registered passengers entering and exiting from any airport within the Emirates are automatically processed. The data entry is then linked to a central system for rapid identification and verification (Copybook Solutions Ltd, 2008). The eGate system is shown in figure 2.2 below.

![Figure 2.2: Dubai’s eGate system turnstiles](image)

Travellers using eGate swipe their Identification cards at the turnstile gate as well as their fingerprints at the touch panel in order to proceed across the border (Dubai eGovernment, 2009). The eGate system is used at Dubai International Airport and Abu Dhabi Airport (Dubai eGovernment, 2009). The initial gates were installed in 2002 at Dubai International Airport. Since then, eGate has been installed at all the six international Airports in the United Arab Emirates. This system has the potential to reduce the amount of physical security staff required for border control as the e-Gate system provides both a physical security barrier as well as expedited passport and immigration controls (Copybook Solutions Ltd, 2008).
2.4. Fingerprint Identification

The use of fingerprint identification is considered one of the most acceptable and least intrusive technologies for common identity management systems (Hutchens, 2007b). Using fingerprints as a form of identification is being examined by airlines as a way of increasing airline security and reducing passenger wait times at check-in, thereby improving passenger flows at airports. The use of fingerprint technology to identify passengers is a simple way to solve a pressing problem, that of correct identification. The following paragraphs highlight examples of fingerprint biometrics used by the Scandinavian Airline System (Precise BioFlight), the UK (miSense) and Hong Kong SAR (eChannel).

2.4.1. Precise BioFlight

Scandinavian Airline System (SAS) has replaced the traditional paper boarding passes given to passengers on check-in and introduced the Precise BioFlight biometric fingerprint check-in at all of their domestic destinations within Scandinavia (Precise Biometrics, n.d.; Scandinavian Airlines Sverige, 2008). This allows passengers to present themselves at the check-in counter where they place their finger on a fingerprint reader. The passenger’s luggage is scanned and Precise BioFlight links the luggage scan to the passenger's fingerprint. Upon boarding, the passenger’s fingerprints are scanned once again and if the system verifies that both the passenger and their baggage are on the plane, they are free to continue. Upon reaching the destination, the fingerprint information is erased (McGroarty, 2008, February 4; Precise Biometrics, 2008a).
This fingerprint recognition system at SAS provides a double back up to verify a passenger’s identity on boarding the aeroplane. Acceptance of the new check-in system is positive with 98% of passengers claiming that the new system increases convenience (Precise Biometrics, n.d.) and SAS are now looking to expand the system across their entire European network (McGroarty, 2008, February 4).

2.4.2. miSense

The miSense programme was introduced in the UK to improve passenger flow at airports by using biometrics in order to reduce the costs of airlines, airports and border control authorities and to enhance security (Accenture, 2007; British Airports Authority [BAA], 2007). The initial phase of the programme, involved scanning departing passengers’ passports and a single fingerprint at a miSense kiosk at check in. Phase two - miSenseplus – was implemented during November 2006 and expanded the use of biometric technology, capturing a facial image, 10 fingerprints, two iris images and passport information for the issue of biometric, registered traveller smartcards, for passengers departing Heathrow’s Terminal 3. Once processed by the UK Immigration Service, miSenseplus passengers are granted permission to use automated gates on arrival from any destination (Accenture, 2007).

The miSense trials were found to improve airport security by verifying passenger identity more effectively than traditional methods and thereby giving authorities greater control over who crosses their borders without overly increasing the security costs (Accenture, 2007). Airlines such as Cathay Pacific and Emirates took part in the miSense trials and plans for a cross-border system between the United Kingdom and Hong Kong SAR were in the preliminary stages of development during 2007.
(Accenture, 2007; BAA, 2007). In parallel with these negotiations, Hong Kong SAR has had its own version of a registered traveller programme called the Automated Passenger Clearance System, or eChannel.

2.4.3. eChannel
Hong Kong SAR’s eChannel was introduced in 2004 to increase service efficiency and improve passenger and vehicle processing rates (Hong Kong Trade Development Council, 2004). The programme is for all persons leaving or entering the SAR at all points of entry or exit including Hong Kong International Airport, Shenzhen Bay, China Ferry Terminal, Macau Ferry Terminal, Tuen Mun Ferry Terminal and the numerous roads that traverse the border into mainland China (Immigration Department, 2008).

eChannel has three different classes of traveller: frequent visitors, students and vehicles (Immigration Department, 2008). eChannel uses the Hong Kong Identity Card as a base and uses fingerprint technology to verify traveller identification at the point of departure or entry via a fingerprint scanner. For drivers, The Automated Vehicle Clearance (AVC) system operates similar to an e-tag system. When a vehicle approaches the clearance kiosk (similar to a toll booth) the vehicles number plate is scanned and the driver’s thumb print is taken for verification. Once this verification is approved, the driver is free to proceed (Hong Kong Trade Development Council, 2004). An AVC point is shown in figure 2.3 below.
2.4.4. Express Entry

Developments in biometric applications outside of both North America and Europe include the introduction of an ‘Express Entry’ system designed by global IT and business solutions company EDS at Israel’s Ben Gurion airport. The biometric system for Ben Gurion allows Israeli citizens to be inspected with a simple swipe of a card. The 'Express Entry' solution at Ben Gurion uses a 90-point hand biometric print to validate the traveller’s identity. The biometric system is processing approximately 150,000 passenger inspections per month (EDS, 2007a).

This example at Ben Gurion highlights the potential for using biometric identifiers for increased security, in addition to using a swipe card as a form of registered traveller programme. The ‘Express Entry’ system has reduced waiting times for travellers passing through security checkpoints (EDS, 2007a). However, biometrics alone, cannot replace traditional inspection and clearance methods enforced by
immigration and customs officers at borders. Biometrics needs to complement these existing safeguards and indeed strengthen them.

2.5 Australia

The aviation system within Australia comprises of interdependent bodies that co-ordinate to allow the public a safe and efficient way of transport. The aviation industry is also a vital piece of national infrastructure necessary for the survival of rural areas (JCPAA, 2004). The elements within the Australian aviation industry include such things as freight and mail transporters and their associated infrastructure, personnel that are employed by industry participants such as terminal shops, and related organisations such as catering, cleaning and ground handling contractors. Nonetheless, Government authorities and the airlines are the predominant industry partners that oversee the system.

Australia has in place a multi-layered approach to security such that any attempts to breach the industry defences are blocked on many levels before it can reach the critical stage whereby an incident could occur (JCPAA, 2004). The levels of security include: (1) the identity of passengers at the time of their initial booking through gathering PNR data by the travel agent or online (JCPAA, 2004); (2) Identification again at check-in by passport and general identification verification (JCPAA, 2004); (3) the passenger and baggage screening process after check-in (Wheeler, 2005); and (4) at the point of immigration and border crossing by validation and clearance of the Movement Alert List (DIAC, 2007). Important developments that underpin profiling are now examined within the Australian context.
2.5.1. Organisational Framework

The authorities that oversee the Australian aviation industry include the Australian Customs and Border Protection Service, the Department of Immigration and Citizenship, the Department of Foreign Affairs and Trade, the Department of Infrastructure, Transport, Regional Development and Local Government.

2.5.1.1. Australian Customs and Border Protection Service

The Australian Customs and Border Protection Service (hereafter referred to as Customs) manage the security and integrity of Australia's borders. The Department works closely with other government and international agencies, in particular the Australian Federal Police, the Australian Quarantine and Inspection Service, the Department of Immigration and Citizenship and the Department of Defence, to detect and deter unlawful movement of goods and people across borders (Australian Customs and Border Protection Service, 2009).

Customs protects the Australian community using sophisticated techniques to intercept illegal drugs and firearms and to target high-risk aircraft, vessels, cargo, postal items and travellers. The techniques employed include intelligence analysis, computer-based analysis, detector dogs and various other technologies (Australian Customs and Border Protection Service, 2001; 2009).

From an aviation perspective, Customs contributes to the multi-layered government approach securing Australia from potential overseas threats (Australian Customs Service, 2007a). Customs handles, on behalf of the Australian Government, such things as cargo intervention, passenger screening, as well as local and international inter-agency cooperation (Australian Customs Service, 2007a). An Australian
example of a passenger-screening programme administered by Customs is SmartGate
(see point 2.5.3.4. SmartGate on page 46 for more detail).

The importance of Customs in administering any form of passenger profiling
programme is vital. Customs are the ‘face’ of the Australian border and are the initial
point of contact with arriving foreigners. Therefore, if there is an acceptance of
passenger profiling because of this research, then Customs could be the
commencement point of a passenger profiling programme.

2.5.1.2. Department of Immigration and Citizenship

The Department of Immigration and Citizenship (DIAC) is primarily responsible for
the entry and exit of foreign nationals into Australia and to assist with settlement if
they so wish (DIAC, 2007). Supplementing this role, DIAC also plays in a role in
monitoring border security by managing a Movement Alert List (see point 2.5.3.1.
Movement Alert List on page 44 for greater detail). DIAC compiles data from local
and international law enforcement agencies in order to keep the list up-to-date. This
is another layer of defence that is used with little publicity.

2.5.1.3. Department of Foreign Affairs and Trade

The Department of Foreign Affairs and Trade (DFAT), issues travel visas and
biometric passports. These passports contain biometric identifiers such as an iris
scan, fingerprint or facial recognition data stored in a microchip inserted in the
passport document (Australian National Audit Office [ANAO], 2003). These
measures aid in providing a multi level layer of protection for passengers in
congruence with other agencies mentioned in this chapter.
DFAT plays an important role in securing Australia’s borders. The act of issuing Australian passports is an integral element in the aviation framework. This is because the biometric information that is held in passports assists in identifying the holder of that passport and can be used to verify such things as nationality and works in concert with the Movement Alert List used by DIAC.

2.5.1.4. Department of Infrastructure, Transport, Regional Development and Local Government
A central element in the Australian federal government’s structure for enhancing protective security within the aviation industry is the Department of Infrastructure, Transport, Regional Development and Local Government (TReDLoG). TReDLoG administers the legislative requirements of the industry to maintain compliance with the International Standards and Recommended Practices (SARPS) of the International Civil Aviation Organisation (ICAO) (Office of Transport Security [OTS], 2005).

The OTS is an arm of TReDLoG and regulates the protective security provided by the Australian aviation industry by working with airports and airlines to assess their risks and their mitigation measures. The OTS also audits airports’ and airlines’ security measures and intelligence assessments together, tests their compliance with legislation and regulation, and recommends any modifications as necessary to policy and security regulation (Wheeler, 2005).

The OTS is an active participant not only in multilateral forums with an interest in aviation security, such as ICAO and the Asia-Pacific Economic Cooperation meetings, but also in other international arrangements for developing the aviation
security capability of Australia’s regional neighbours. Much of this new focus is on aviation security at last ports of call for flights bound for Australia. This complements the stronger focus placed on risk-based appraisals of arriving flights in Australia since 9/11 (Wheeler, 2005).

Prior to any form of passenger profiling system being implemented, there are a number of measures that need to be taken in order to minimise the potential clash between civil liberties and the need for a stronger security presence. This includes the legislative instruments that are in place in the Australian aviation industry to protect the passenger from any untoward usage of their personal information.

2.5.2. Legislative Requirements

Legislative tools within the Australian aviation industry align Australia’s aviation security framework with the global standards set by ICAO (OTS, 2005). These Acts and Regulations are the guidelines as to how aviation security within Australia is to be administered. The overarching security legislation that governs aviation security in Australia is the Aviation Transport Security Act 2004 [later referred to as the Act]. This Act establishes the regulatory framework which all industry participants must adhere to in order to safeguard themselves and their users against unlawful interference. Supplementing the Act is the Aviation Transport Security Regulations 2005 [later referred to as the Regulations]. These Regulations outline the procedures to be followed for the successful implementation of the Act, as well as procedures for transport security programmes, airport areas and zones, other security measures (Commonwealth of Australia, 2005).
The Act stipulates the requirement for industry participants to endorse a security programme factoring how security operations and breaches will be handled. In addition, the Act points out specific requirements relating to on-board security, passenger screening and the development of an integrated response and proactive approach to managing aviation security. Therefore, the approach taken by the industry should incorporate layers of defences in more than one area (Glamberakis & Watson, 2009). Australia is adopting this integrated, proactive format in the management of aviation security. That is, instead of having only one security feature like a screening guard, the system has multiple features, each backing up the other to strengthen the system and make it harder for would-be criminals to penetrate the system (Transportation Research Board, 2002).

Working in tandem with the Act, the Crimes (Aviation) Act 1991 [later referred to as the Crimes Act] relates to crimes committed on board an aircraft, or in respect to an aircraft, aerodrome, or airport or air navigation facility. Crimes include hijackings and other offences relating to the safe operation of aircraft such as the seizure, destruction, and threatening the safety of an aircraft and endangering the safe operation of aerodrome facilities. (Commonwealth of Australia, 1991). The Crimes Act points out Australia’s obligatory commitments for the imprisonment and length of time under government custody of any offender who commits a crime as described under the Crimes Act. How authorities can restore control of the aircraft and deal with offenders through the judicial system is also covered in the Crimes Act (Commonwealth of Australia, 1991). Australia has instigated numerous border security initiatives in order to meet its requirements under the respective legislative arrangements that are in place.
2.5.3. Border Security Initiatives

Since 9/11, the Australian Federal government established the Office of Transport Security in an effort to instigate new initiatives to strengthen Australia’s aviation security network. In doing so, all State governments within Australia agreed to a National Transport Security Strategy and an Inspector of Transport Security was established to investigate major security incidents that point to systematic weaknesses within aviation or maritime regulatory systems (Wheeler, 2005).

Additionally, the role of the Australian Protective Service was strengthened to include explosive detection. The government also expanded the aviation security regulatory regime, tightened airport access, increased passenger, baggage and cargo screening, hardened cockpit doors as per required by ICAO. It also improved security coordination among the Department of Infrastructure, Transport, Regional Development and Local Government, Customs, the Australian Quarantine Inspection Service, the Australian Federal Police, the Australian Security Intelligence Organisation and the Department of Immigration and Citizenship at major airports (Wheeler, 2005).

Along with the above methods, further measures were taken to strengthen Australia’s borders. These additional measures included the introduction of a movement alert list, an advanced passenger information system, the ePassport and SmartGate border entry system. Each of these are now discussed.
2.5.3.1. Movement Alert List
The Movement Alert List (MAL) is the primary tool for protecting Australia from people who pose a serious threat to the Australian community and is the principal means of electronic data surveillance on people and travel documents of concern to immigration, law enforcement and security authorities (DIAC, 2007; Wheeler, 2005).

The MAL comprises of a Personal Alert List and a Document Alert List (Joint Standing Committee on Migration, 1999). When a passenger wishes to come to Australia, their details are checked against the MAL when they apply for either an Electronic Travel Authority (ETA) or an eVisitor visa. If a match is recorded, it must then be determined if the person should be granted a visa (DIAC, 2008a).

This list contains details about persons both here and overseas who are of interest to Australian authorities and/or pose a risk to the security of the country (ANAO, 1999). People listed on the MAL are considered by Australian authorities to constitute a risk to the community. Categories of risk on the MAL include the ‘high risk’ category, which incorporates national security and organised immigration fraud, ‘medium risk’ including either health and general criminal convictions, or ‘low risk’ which includes people who overstay their visa and persons with debts to the Commonwealth (Malley, 2004). There were approximately 640,000 identities listed on the MAL at the end of October 2008 (DIAC, 2008a).

As profiling is done covertly, its integration into the MAL may easily be achieved with minimal change. Dependant on the results of this research, if respondents are accepting of a passenger profiling system, then using it as part of the MAL is feasible.
2.5.3.2. Advanced Passenger Information System
In addition to the MAL, DIAC also have an Advanced Passenger Information System (API). This system transmits information to authorities in Australia about travellers prior to their arrival. This data can include information about passengers, crew and those remaining in transit for elsewhere. The information can then be checked against warning lists and used for immigration processing, security and customs purposes (DIAC, 2007). Utilising a system such as an API can be beneficial as it provides for a stricter level of scrutiny through checking of travellers and allows for the increased free flowing of passengers once they arrive due to passengers being 'pre-processed' before arriving at the border (DIAC, 2007). All of these initiatives help to enhance border security.

The API system may be considered a pseudo passenger profiling system as it gathers information about travellers and uses that information against known threats by identifying threats before they arrive or depart. The potential implementation of a proper passenger profiling system may then be assisted as a further element of the existing API and MAL.

2.5.3.3. ePassport
Biometric documentation containing micro-chipped data has been introduced in Australia to further enhance border security. DFAT has the task of issuing and renewing all Australian passport applications (DFAT, n.d.). The security features of Australian passports were enhanced in 2005 by the incorporation of microchips with biometric identifiers into passports; this became known as the ePassport (DFAT, n.d.). The ePassport protects passport information from misuse by the strict
adherence to guidelines that control how government departments can use the information that is contained within the ePassport (DFAT, n.d.).

The use of biometrics in a passport has the potential to minimise the likelihood of counterfeiting passports, as each passenger will have to be identified both visually and biometrically once the passenger reaches customs and immigration. DFAT is working towards this with ICAO (DFAT, n.d.). Incorporating biometric identifiers can further develop the interoperability of Australia’s security system across a global network. Programmes similar to the ePassport are being considered for implementation in the USA (Szyliowicz, 2004).

2.5.3.4. SmartGate

In August 2007, Customs introduced automated border processing, known as SmartGate (DIAC, 2008b). This system has three fundamental elements that are the keys to its success; these are facial recognition technology, Machine Readable Identification abilities and instant background checking of passengers against the Movement Alert Lists using the Advances Passenger Information system. SmartGate has been introduced at Adelaide, Brisbane, Cairns, Melbourne, Sydney airports within Australia and Auckland International airport in New Zealand for arriving travellers (Australian Customs Service, 2009).

SmartGate is a two-step process involving a kiosk and a gate. Step one involves the passenger placing their ePassport into the reader located within the service kiosk. They then answer the standard declarations for international flights on the touch screen. If the traveller is eligible to self-process, the kiosk will issue a ticket. If the passenger is not eligible, the traveller is directed to a Customs officer for manual
processing. In step 2, SmartGate performs the identity check and clearance. The passenger inserts their ticket into the kiosk and a photo of the passenger’s face is taken. This is then compared to the image in their ePassport. If the images match and clearance is verified, the ticket is re-issued and the traveller can pass through the gate. If the images do not match and/or clearance is not verified, the ticket is retained and the traveller is directed to a Customs officer for manual processing (Australian Customs Service, 2009; DIAC, 2008b; Sharma, 2008, April 08).

SmartGate utilises the digital signature embedded within a passenger’s ePassport. It does this by reading the unique barcode, or Machine Readable Identification (MRID). MRID is the personalised digital signature that is unique to each ePassport. This system is an innovation that can greatly strengthen not only aviation security, but also general border security for Australia. In terms of aviation security, the prevalence of passport fraud can be reduced using SmartGate as it gives the Australian Government the opportunity to improve identity verification at Australia’s border. This is a major deterrent to the use of forged or stolen passports and helps to combat identity fraud (Australian Customs Service, 2007b).

In addition, SmartGate can also interface with the API and MAL to assist customs and immigration officers in conducting checks of incoming passengers by verifying passenger details. If there is any discrepancy between what is on their arrival card and their passport details, the passenger is then sent for further scrutiny by a Customs officer. If there are no issues, the passenger is cleared to proceed through and collect their baggage (Australian Customs Service, 2007a).
2.6. Summary

Chapter 2: Literature Review has highlighted the extent to which variations of passenger profiling are being used as an avenue of increased security within the global aviation industry. Chapter 2 has discussed the ways and means available for authorities if they wish to pursue passenger profiling as a security option. These include PNR access, the introduction of registered traveller schemes and the use of biometrics in passenger identification at borders. Within the scheme of this research, having knowledge of the many ways in which passenger profiling is being implemented within the aviation industry, assists in understanding how other countries have dealt with the introduction of passenger profiling programmes and how the general public have reacted to them. The second half of the chapter examined the Australian aviation industry and the initiatives being taken regarding increased aviation security measures.

Referring to the research question of ‘Will passengers accept passenger profiling in its various forms, as a further way for authorities to increase aviation security?’ from the literature reviewed within this chapter, it may be surmised that, from an international perspective, that the acceptance of passenger profiling programmes by the travelling public has been complicated. Especially in the areas related to the securitisation of, and accessibility to, passenger information.

While it is important to understand the literature, it is equally important to understand the theory behind the need for measures such as profiling. This is examined in Chapter 3: Theoretical Framework.
Chapter 3: Theoretical Framework

According to Rogers (1975), theory is said to bring order out of chaos. Rogers’ (1975) statement could be interpreted to mean that theoretical underpinnings are important in order to bring about an understanding of phenomena in a clear and concise manner. This chapter examines the theoretical bases of risk management and, to a lesser extent, criminology and decision-making, used in this thesis.

Passenger profiling, from a risk management perspective, can be used by airlines to reduce the likelihood of unlawful acts against aviation. An analysis of the interrelationship between beliefs, attitudes and other influences on future action through decision-making theories strengthens the linkage between passenger profiling, risk management and criminology.

Regarding the research question, ‘Will passengers accept passenger profiling in its various forms, as a further way for authorities to increase aviation security?’ This chapter gives an overall understanding of why passenger profiling may be needed as a risk control measure. By examining the theory behind risk control, this thesis can potentially give an indication as to how passenger profiling may be used within the Australian aviation industry.
3.1 Risk Management

“It is better to have a general and incomplete map, subject to revision and correction, than to have no map at all.”

(Toffler, 1990)

Risk management refers to the assessment of the level of risk that an operation faces in the execution of its business (Wood, 1991). This is particularly so within the context of aviation. Because aviation is an integral part of globalisation, the use of aircraft as a means of transporting people and goods has become a vital element in the global economy (Szyliowicz, 2004). Therefore, its sustainability is elemental to the success of both the Australian and global economy (Joint Committee of Public Accounts and Audit [JCPAA], 2004). One of the primary methods on dealing with risk is through the use of risk management programmes.

Passenger profiling programmes may be seen as a proactive risk control measure used to reduce the likelihood of unlawful interference with an aircraft or associated infrastructure. From an aviation legislation perspective, Part 1, Division 5, Section 10 of the Aviation Transport Security Act 2004 (Cth) identifies the meaning of unlawful acts of interference with aviation as:

(a) taking control of an aircraft by force, or threat of force, or any other form of intimidation;

(d) doing anything on board an aircraft that is in service that puts the safety of the aircraft, or any person on board or outside the aircraft, at risk;

(e) placing, or causing to be placed, on board an aircraft that is in service anything that puts the safety of the aircraft, or any person on board or outside the aircraft, at risk;

(h) committing an act at an airport, or causing any interference or damage, that puts the safe operation of the airport, or the safety of any person at the airport, at risk.

(Commonwealth of Australia, 2008).
Passenger profiling aims to reduce the incidence of unlawful acts of interference with aviation, through its integration into organisational risk management protocols. This thesis will now discuss ways to define risk before analysing the Australian and New Zealand risk management standard (ANZS 4360:2004), (hereafter referred to as The Standard). The discussion relates to the application of the Standard in aviation and particularly within the context of passenger profiling, before discussing aviation risk management and passenger risk perception.

3.1.1 Definitions
Hunter (2002) describes risk in terms of its perception within the public, noting that risk is the subjective assessment of the possibility of injury or loss of life in relation to encountering a hazard. Similarly, risk can be defined as an outcome of two variables: a) the likelihood of injury; and b) the severity of the potential consequences (Lowrance, 1980; Slovic, Fischoff & Lichtenstein, 1979). Furthermore, Wogalter, Young, Brelsford and Barlow (1999) proposed that the likelihood or probability component was the most important factor, because people base their risk perception on the potential for injury. If passenger profiling is being used to lower the probability of risk, then it could be a positive step for the industry by limiting the probability and likelihood that Lowrance (1980), Slovic, Fischoff and Lichtenstein (1979) point out.

Risk can also be seen as the possibility of loss, injury, disadvantage or destruction (Beer & Ziolkowski, 1995). These potential losses, injuries, exposures and hazards can manifest themselves in many areas. According to ICAO, risk management refers to “conserving assets and minimizing exposure to losses, [which] means looking
ahead to detect hazards before they lead to losses and taking the appropriate actions when these risks cannot be eliminated” (ICAO, 1984, p. 23). ICAO’s definition incorporates a proactive stance on risk management as it dictates organisational contingency planning. ICAO’s definition is the preferred option in this research. In an aviation context, there are many types of risk faced by individuals and organisations. These risks can come in many forms from passenger air rage (Berkley & Ala, 2001); disruptive passengers, in-flight assaults, airport and aircraft sabotage (Thomas, 2003) to that of terrorism (Johnston, 2004). In order to minimise these risks, the aviation industry follows mandated risk management processes and protocols.

3.1.2. Risk Management Process
Risk management is an ongoing process that should be undertaken at various stages. These stages are: prior to commencing operations; when a new venture is in the planning stage; when any significant changes occur within or external to, the business; after accidents and major incidents; and at regular predetermined periods (University of Queensland, n.d.). There are many ways to undergo a risk management process (ICAO, 1984; Reid & Reid, 2005; Wells & Chadbourne, 1992). The risk management process is mandated by the Australian and New Zealand risk management standard (ANZS 4360:2004) and displayed in the figure 3.1 below.
This process is widely recognised as being the applicable test for the management of risks (Wheeler, 2005). The risk management process consists of seven steps. These are (1) Establishing Context, (2) Identify Risks, (3) Analyse Risks, (4) Evaluate and Rank Risks, (5) Treat Risks, (6) Monitor and Review, (7) Communication and Consultation. Step five ‘treat risks’ is where passenger profiling could fit within the risk management process. These elements are examined below.

3.1.2.1. Establish Context
The initial step in the risk management process is to establish the context of the risk. Establishing the context of the risk is vital as it clearly defines the parameters of the risk situation and the available mitigation options. In terms of aviation security and passenger profiling, the context of the risk can be considered as the establishment of procedures that assist in minimising the danger posed by persons intending to
unlawfully seize an aircraft and/or cause damage to critical aviation-related infrastructure. Additionally, the risk takes place within the confines of either an aircraft cabin or the terminal area. Consequently, the reaction of innocent bystanders and the ability of authorities to control the immediate area need to be considered.

3.1.2.2. Identify risks
Once the context has been established, the second step is to identify the risks being assessed. Identifying risk is done in a number of ways including direct reports from employees, visitors or contractors; hazard and incident reports; general knowledge and experience of staff; workplace inspections; information provided by suppliers, designers and manufacturers; information from similar workplaces; and organisational occupational health, safety and environment committees (Monash University, 2007). Identifying risks against key organisational objectives gives management a strategic approach to risk (University of Oxford, 2006).

The source of risk can originate from a number of areas. For example, one of the risks realised post-9/11 was the immediate downturn in airline traffic. Demand fell sharply in view of the perceived threat to safety, which in turn resulted in large losses for airlines globally (Brück, 2002). The provision of security profiling could be seen as a way to minimise the likelihood of such events reoccurring.

3.1.2.3. Analyse risks
The third step in the risk management process is to analyse the risk. Any threat, whether real or imagined, needs to be put into the correct context in order for a proper appraisal to be done. According to Kunreuther (2002, p. 656), risk analyses are used to “estimate the chances of a specific set of events occurring and/or their
potential consequences”. It is the chances of the event occurring, or recurring that creates the greatest divergence of opinion. Risk analyses are undertaken to minimise the level of risk to the community and the perception of risk held towards an industry or organisation. In situations where there is no data, a thorough examination of all the possible outcomes of an event takes on increased importance (Anand, 2002).

According to Hakes and Viscusi (2004), people are more systematic in their assessment of large risks. This can be explained by risk tolerance. Risk tolerance has been described by Hunter (2002) as the amount of risk that individuals are willing to accept in the pursuit of their goals. This is precisely what happens when someone decides to travel by aeroplane. The inherent risk of flying, as well as the loss of personal space and control, is overcome by the need to get somewhere within a relatively short period. From an industry perspective, it is best to lower the amount of risk and increase the risk tolerance level of passengers in order to maintain industrial viability. This could be accomplished by increasing security measures via the introduction of passenger profiling.

3.1.2.4. Evaluate risks
The fourth step is to evaluate the risks identified. Systemic risk evaluation is well established in the aviation industry especially relating to human error (Wiegmann & Rantanen, 2002). In terms of aviation, the evaluation of security risks may be influenced by the probability of their occurrence, along with the severity of their consequences. For example, there is a high level of risk associated with terrorist attacks, or unlawful seizures of aircraft because of the potentially disastrous consequences. Those consequences include potential loss of life, damage to infrastructure, loss of economic goodwill and organisational reputation, as well as
potentially disrupting entire transportation networks (co-located at or near the airport terminal, such as railway and bus stations).

All of these elements need to be evaluated in a structured and orderly manner so that the risk management process remains reliable and valid. Once accomplished, the next step is to treat or control these risks as best as can be done.

3.1.2.5. Treat risks
The treatment of risk is a vital element in risk management and is where passenger profiling could fit. As mentioned, passenger profiling can be considered a risk treatment process as it endeavours to reduce known risks to aviation such as passengers attempting to take control of the aircraft mid-flight. The ways in which organisations treat risks vary. According to The Standard, there are three risk treatment methods. These are, in order of preference from the least preferred to the most preferred, Prevention, Preparedness, Response and Recovery (PPRR), Avoidance, Reduction, Sharing and Acceptance (ARSA), and the more widely accepted method of the Hierarchy of Controls.

The PPRR method of treating risk is predominantly used to protect critical infrastructure (Emergency Management Australia, 2002). This control method investigates the likelihood of accidents occurring and how well prepared an organisation is to handle the consequences. The PPRR approach to risk management utilises a risk analysis as the primary point of reference relating to potential risks. Risk analyses undertaken using the PPRR method are usually wide in scope and application due to the large number of outcomes and contingencies needed when protecting critical infrastructure.
The Australian aviation framework uses the PPRR method (Wheeler, 2005). According to Wheeler (2005), the Australian Government’s risk management approach to aviation terrorism is based on maximum preparedness, comprehensive prevention, and effective response. This is seen to ensure the protection of national critical infrastructure as well as a broad engagement with the Australian public. In terms of aviation profiling, it can be considered to fit within the prevention stage of the PPRR method as passenger profiling seeks to prevent unlawful actions related to critical aviation infrastructure.

The next treatment method is the ARSA approach. According the University of Oxford (2003), avoidance instructs organisations to seek alternate procedures or activities to remove the risk in-toto. The second element of reduction acknowledges that risk cannot be avoided, but attempts to reduce the likelihood of the risk and amount of potential damage that the risk can cause (University of Oxford, 2003; Wells & Chadbourne, 1992).

The third factor of sharing involves minimising the risk by transferring it to a third party (University of Oxford, 2003). Risk sharing is common within the insurance industry, where risk reinsurance companies purchase a level of risk from a general insurer and thus spread the potential loss (Wells & Chadbourne, 1992). The final factor of acceptance is deciding to tolerate the risk. This usually occurs when the likelihood and impact are relatively minor, or when it would be too expensive to mitigate (University of Oxford, 2003; Wells & Chadbourne, 1992).
Of the three methods, the most accepted by the aviation industry is the Hierarchy of Control. The Hierarchy of Control ranks risk control measures in decreasing order of desirability and effectiveness (Monash University, 2007). The higher in the hierarchy of control, the better and more reliable the control is (The State of Queensland, 2008; University of Melbourne, 2006). The five steps of Hierarchy of Control are: (1) elimination, (2) substitution, (3) segregation/engineering, (4) administrative controls and (5) personal protective equipment. Passenger profiling could fit within either points one (elimination) or three, (segregation/engineering). Of the five points, these two will be emphasised.

The initial step in the hierarchy of control is to eliminate the hazard. Hazard elimination is the most effective method as the risk is completely removed (Monash University, 2007; University of Melbourne, 2006; University of Queensland, n.d.). For example, a large multinational organisation may be assessing whether or not to enter a new country. During their risk assessment process, a political hazard (such as an unstable political environment) may be identified. In order to eliminate the hazard the organisation may choose not to enter that country’s market, thereby eliminating the risk associated with operating in an unstable political climate. Using passenger profiling can be interpreted as a method of eliminating hazards as profiling is used to reduce the risk of threats to the aviation industry. As a method of risk management, profiling would be suited as an avenue of elimination.

The second step is to substitute the hazard by replacing the known hazard with a lesser affecting hazard (The State of Queensland, 2008). This could be a solution if the risk cannot be removed. For example, workers in a chemical factory may replace
a highly hazardous chemical with a less hazardous one. Although not entirely removing the risk, the potential consequences have been reduced.

The third step is, to segregate or engineer the risk out. The segregation of risk can be completed merely by the removal of the risk (see the initial step in the hierarchy of control). Engineering out a hazard is done by changing processes, equipment or the tools being used (Monash University, 2007). One example of engineering out the risk is the increased use of automation within the aviation industry. For example, the Primary Flight Display (PFD), which displays aircraft information on a central computer screen within the cockpit, has replaced the multitude of placards and warning stickers on the panel. Warnings are now colour coded white (least important), yellow (medium importance) and red (requiring immediate attention) (Wilson, 1993).

A further way of engineering the risk may be the introduction of passenger profiling. The use of profiling as an engineering measure conforms to the requirement that to engineer the risk out, an alteration to processes is done. In this case, there would be changes to the existing processes if a passenger profiling technique were adopted.

If the risk remains, administrative controls should be applied. Administrative controls are the procedural aspects of managing hazards, such as planned and preventative maintenance programs, standard operating procedures, lock out/tag out procedures, education and training and the rotation of staff to minimise risk exposure (University of Melbourne, 2006). An example of an administrative control is the Civil Aviation Safety Authority’s (CASA) Aviation Self Reporting Scheme (ASRS).
This programme allows individuals to report any unintentional breach of regulations to the regulator without fear of reprisal (Australian Transport Safety Bureau, 2006).

The final step is the removal of the hazard by using personal protective equipment. Personal Protective Equipment (PPE) is used as a last resort when exposure to risk is not or cannot be minimised by other means (University of Queensland, n.d.). This step includes clothing worn by people as a final barrier between themselves and the hazard (University of Queensland, n.d.). Such items of clothing can include laboratory coats, safety glasses, closed shoes/boots and hearing protection (Monash University, 2007).

3.1.2.6. Monitor and review
The next step in the risk management process, according to the Standard is to monitor and review the process. The purpose of this step is to ensure that the risk management programme being undertaken remains relevant to the organisation as time progresses (Emergency Management Australia, 2002). During this stage, changes are made to the risk profile of the organisation based on the context and/or source of the risk, changes to organisational or industrial stakeholders, and alterations to the operating environment and general events that may influence the level of risk to the organisation (University of Western Australia, 2003).

Importantly, constant monitoring and reviewing of the risk process ensures the effectiveness of the risk treatment being used. In addition, it ensures that any changes in organisational circumstances are kept in the forefront of risk managers’ decision-making process, thereby maintaining the relevancy of the organisational risk factors being mitigated.
3.1.2.7. Communicate and consult
The communication and consultation element of the risk management process, although depicted as the final stage, is a constantly occurring process. It is imperative that at each stage of the risk management process, information is communicated to the stakeholders of the organisation.

According to Emergency Management Australia (2002), the factors needing consideration when communicating are: the audience (whom exactly are you targeting), the content (unambiguous language, simplistic, formal), any assumptions that are made (social, religious, cultural, technical), the mode of information transfer (memorandums, journals, peer-to-peer), accessibility (language, readability), sensitivity (political correctness, empathy), and boundaries (legal, political, social). Once these elements have been considered and an appropriate transaction medium has been agreed upon, the message can be sent. This thesis now examines risk management from a distinct aviation perspective.

3.1.3. Aviation Risk Management
The aviation industry has been described as a tightly coupled, high reliability industry operating in a high-consequence environment (Transport Canada, 2006). In a tightly coupled system, any form of change or disruption has an immediate flow on effect to other areas of the business or industry (Transport Canada, 2007; White, 2007). This description implies that any change in risk-management procedures by any one stakeholder can have a domino effect on the effectiveness of risk management initiatives by others (Transport Canada, 2006). Tightly coupled industries also have the propensity for extreme failure when an accident occurs. This
propensity is due, in part, to the likelihood that failure in one part of the system, creates failures for the remaining parts in a tightly coupled organisation (Frederickson & LaPorte, 2002).

Tightly coupled industries are commonly referred to as having organisations that are highly reliable (Frederickson & LaPorte, 2002; Roberts, 1990; Weick, 1987). High-reliability organisations have few accidents, despite operating in highly dynamic, technologically rich, and hazardous environments. Weick and Sutcliffe (2001) attribute the success of high-reliability organisations to managing risk through heightened vigilance. These organisations rely heavily on being acknowledging and reducing errors when discovered. Examples of high reliability areas include air traffic control and nuclear power (Hargrove & Glidewell, 1990) and rail (Jeffcott, Pidgeon, Weyman & Walls, 2006). Considering these factors, aviation can also be described as a tightly coupled, high reliability industry that attempts to minimise risk at every stage in order to maintain safety and security for all involved.

Any assessment of aviation risk, concerns itself with rare events that occur at irregular intervals (Thomson, Önkal, Avcioğlu & Goodwin, 2004). Attempting to predict and prevent rare events creates a dilemma for aviation risk assessments. Risk assessments in aviation are hampered by the lack of evidential factors to substantiate an all-encompassing risk assessment. In other words, there is potential for extreme damage, but there is minimal likelihood of such events.

According to O’Malley (2006), the level of risk an organisation faces is centred on the level of intelligence or data than an organisation has relating to that risk. In
addition, any form of risk calculation data that is acquired through research, is likely to reproduce what is already currently known in the organisation, thus reaffirming the existing stance taken by management (O’Malley, 2006). Hence, this new information goes unnoticed, or if it is, is ignored, as it will not, or does not, confirm the status quo.

O’Malley’s (2006) statement above that new information is ignored if it does not conform to existing ways of thinking was prevalent within the aviation industry prior to 9/11. According to Birkland (2004) and Parker and Stern (2005), there was an abundance of warning prior to the 9/11 that there was a desire by groups to cause major havoc within the USA, and that aviation security should be enhanced in order to circumvent those attempts. Those concerns went unheeded. Consequentially, Birkland (2004) states that passenger profiling should be implemented in order to limit the likelihood of such events happening again. Therefore, profiling can be seen as a method of limiting an organisation’s exposure to risk.

From an aviation perspective, the importance of risk management cannot be overestimated, as the consequences of failure and likelihood of failure are present. One of the more popular methods of risk minimisation in the aviation industry is the use of Reason’s (1997) Model of Accident Causation. The application of passenger profiling may be integrated within the Reason Model as a form of ‘defence’ against accident occurrence.
3.1.4. Reason Model of Accident Causation

The Reason Model of Accident Causation (hereafter referred to as ‘The Reason Model’) is a generalist model that attempts to trace the root causes of accidents and organisational errors that arise within an organisation (Luxhøj & Maurino, 2001). The Reason Model is a method of risk management used within the high risk-low probability industries such as aviation (Reason, 1997), rail (Department of Infrastructure, 2001), medicine (van Vuren, 1999) and oil production (Reason, 2001).

The Reason Model highlights the areas that can influence an organisational accident and the avenues of investigation post-accident. It states that any accident is not the fault of any one individual or any one action, but a multitude of factors that all combined to cause the accident occurrence. The Reason Model builds on previous accident investigation models, most notably the “Swiss Cheese” Model (Reason, 1997, p. 9). Both of these models state that an organisation has different layers of defences against an accident and these layers have in-built gaps or holes (like a piece of Swiss cheese) through which the accident trajectory can flow. The Reason Model is depicted in Figure 3.2 below.
Defences guard an organisation against dangers and hazards that can potentially develop into an accident (Reason, 1997). In order to avoid such a scenario, mechanisms are put into place that attempt to curtail these triggers. It is these layers of defence, or defences-in-depth, where passenger profiling can fit within the Reason Model. As profiling can be viewed as a further defensive layer of aviation security, profiling can be integrated into the defensive framework as a soft defence mechanism as it is covert in nature and thus unrecognised by the travelling public. Accident occurrence is assisted by systemic elements within the organisational environment. These three elements are termed organisational factors, local workplace factors, and unsafe acts.

The usage of risk management measures within the aviation industry has been shown in these paragraphs to be of great importance, as risk management protocols are in place to reduce the likelihood of accident and incident occurrence. Passenger
profiling can assist with this reduction by becoming an extra administrative control, or defensive layer within the Reason Model.

Relative to the research question of “Will passengers accept passenger profiling, in its various forms, as a further way for authorities to increase aviation security?” The Reason Model may be used as a tool of implementation, should there be agreement on the implementation of a passenger profiling programme. One of the reasons behind instituting passenger profiling as a risk control measure is to reduce the possibility of criminal acts within the aviation industry. This may be done by analysing criminology to understand why people enact criminal activity.

### 3.2 Criminology

A criminal act is defined as a wrongdoing to society involving a violation of a legal rule, resulting in consequences punishable by the state (Wells & Chadbourne, 1992; Williams, 2004). People predominantly commit crimes because of two reasons. Either they are dissatisfied with the situation that they may find themselves in, or because they are being placed under a perceived strain. Two criminology theories are used as part of the examination of the survey results. These are the Routine Activity Theory and Rational Choice Theory. Their description and usage is discussed in Chapter 4: Methodology on pages 70-99.

With the emphasis on profiling to stop the occurrence of criminal acts (Thomas, 2003), it is important to consider why these acts take place. In relation to passenger profiling, criminology helps to understand why people enact a crime, which then leads authorities to increase security levels. It is within these increased security levels
that passenger profiling relates to criminology. From an aviation perspective, rectifying or reducing such activity may be assisted by introducing a passenger profiling system in order to reduce the potential likelihood of criminal activity.

The foundations of classical criminology are that: (1) people have free will; (2) criminal activity is an easy way to attain personal satisfaction and wealth; (3) the choice of crime over law can be controlled by the fear of consequences given by authorities; and (4) the more severe the punishment, the greater chance there is to control criminal behaviour (Siegel, 2008). Therefore, the classical school of criminology emphasises the need for credible threats of apprehension and punishment in order to deter criminal activity (Dugan, LaFree & Piquero, 2005).

It is the threat of apprehension where passenger-profiling would fit within the foundations of classical criminology as passenger profiling attempts to reduce the potential for criminal activity by increasing the likelihood of being caught.

Along with criminal theories, understanding the linkage between beliefs and attitudes is important in understanding why people decide to commit crime. Decision making theories are now examined to achieve this understanding.

### 3.3. Decision making

Decision-making is essentially the process that individuals take when having to decide on a choice or course of action. This is accomplished through the acquisition and interpretation of stimuli before enacting an appropriate response (Dalcher, 2002; March, 1994; 1997; Weick, 1995). Decision-making by the travelling public is an
important determinant in the success or otherwise of various aspects of the aviation industry. Therefore, the application of various theories to explain the decision-making intentions of passengers is required when determining the success or otherwise of security initiatives.

This thesis examines three decision-making theories applicable to this research. These theories are the Protection Motivation Theory, Prospect Theory and Information Integration Theory. These theories are examined as part of the data analysis process.

3.4 Summary
This chapter sought to explain the theories that have been used in this thesis as grounding for this research. The theoretical base has come from risk, and to a lesser extent, criminology and decision making. Throughout the chapter, the applicability of these theories and protocols has been linked to passenger profiling.

The linkages of all three areas are that the attitudes and beliefs of individuals can influence their decisions on how they go about their lives and whether or not they will turn to crime to satisfy a perceived injustice (Decision Making). It is then important to understand the next level, that is, why they have turned to crime in an attempt to rectify this injustice and how situational factors and the perception of an individual’s ‘strain’ can influence criminal activity (Criminology). Once someone turns to crime, it is important to safeguard infrastructure against the occurrence of criminal activity and this is accomplished by the use of risk management protocols (Risk Management).
Referring to the research question, ‘Will passengers accept passenger profiling in its various forms, as a further way for authorities to increase aviation security?’ Chapter 3 has provided the theoretical basis for the acceptance of passenger profiling as a risk control measure through the interrelationship between risk, criminology and decision-making. It is with risk control measures such as this that aviation security can be increased. Chapter 4: Methodology further expands on these theories by applying them to the research method and data analysis process.
Chapter 4: Methodology

4.1 Methodology Overview
In research, two avenues can be chosen when deciding on a methodological style. These are qualitative and quantitative avenues. Qualitative research derives meanings of social phenomena such as attitudes, perceptions and behaviour by people in their natural environment (Coffey & Atkinson, 1996; Lincoln & Guba, 1985). Additionally, qualitative methods are used when the variables are unknown, or there is no specific theoretical base (Creswell, 1994) and the researcher observes and interacts with participants in their natural surroundings (Kirk & Miller, 1986). Therefore, to understand a phenomenon fully, the researcher becomes immersed within it (Denzin & Lincoln, 1994).

Conversely, quantitative methods are detailed, unbiased, plans of action based on being objective to the subject and measuring results by statistical methods and numbers (Abusabha & Woelfel, 2003; Creswell, 1994; Reichardt & Rallis, 1994).

This thesis utilises a mixed-method approach incorporating non-experimental, investigative, observational, inductive and deductive methods to analyse the data. Each of these methods are now discussed.

4.1.1. Mixed-Method Approach
There are multiple mixed-method approaches available to the researcher. Leech and Onwuegbuzie (2005) have conceptualised these into three dimensions, namely: the time orientation (i.e., the order in which the data are used in a study); the emphasis of
approach (qualitative over quantitative or vise versa); and the level of mixing
(partially versus fully mixed). Creswell (2002) varied Leech and Onwuegbuzie’s
(2005) research by stating that the emphasis factor should be classed as the relative
weight of the quantitative and qualitative approaches (i.e., the emphasis given to
each). The timing, weighting and mixing of the data are now examined.

Timing
Creswell and Plano Clark (2006) state that concurrent timing occurs when the
researcher implements both quantitative and qualitative methods during a single
phase of the research study. This means that the quantitative and qualitative data are
collected, analysed, and interpreted at (approximately) the same time. Whereas
sequential timing occurs when the researcher implements the methods in two distinct
phases, using (collecting and analysing) one type of data before using the other data
type. This research uses concurrent timing.

Weighting
Weighting refers to the relative importance or priority of the quantitative and
qualitative methods to answering the study’s questions (Creswell & Plano Clark,
2006). This choice has been referred to as the priority decision (Morgan, 1998)
because a researcher decides whether both methods will have equal priority or one
method will have a greater priority than the other.

Morgan (1998) states that the weighting in a study be based on the strength of which
the data collection method is best suited to address the study’s goals or purpose. The
weighting is thus influenced by the goals, the research question(s), and the use of
procedures from research traditions such as quantitative experimental designs or qualitative case study designs. The weighting may also reflect the researcher’s relative experience with the two methods, particularly if he or she is significantly more familiar with one method than the other (Creswell & Plano Clark, 2006).

Mixing
Mixing is the explicit relating of the two data sets. A study that includes both quantitative and qualitative methods without mixing the data is simply a collection of multiple methods. A rigorous and strong mixed methods design addresses the decision of how to mix the data, in addition to timing and weighting.

The data is mixed when the two data sets are integrated into one. According to Creswell and Plano Clark (2006), researchers can merge the two data sets during the interpretation (by analysing them separately in a results section and then merging the two sets of results together during the interpretation or discussion phase) or during the analysis of the data (by transforming one data type into the other type or consolidating the data into new variables). This research mixes or merges the data during the interpretation or analysis stage.

Creswell, Plano Clark Gutmann and Hanson (2003) describe the best way for a researcher to decide what type of mixed method approach to take is to ask the questions and follow the answers in the decision tree shown in Figure 4.1 below.
Following this decision tree in Figure 4.1 above, the timing of the methods in this research is concurrent. The weighting to each of the approaches (qualitative and quantitative) is equal. The methods will be mixed at the conclusion of the research during the analysis stage. Therefore, the style of mixed-method approach used in this research is a concurrent triangulation as described by Creswell, Plano Clark, Gutmann and Hanson (2003). Creswell et al. (2003) state that concurrent triangulation involves the concurrent, but separate, collection and analysis of quantitative and qualitative data, with the researcher then merging the two data sets.
as part of the analysis and interpretation, in order to best understand the research problem.

A mixed method approach has been chosen due to its extensive use in aviation including flight instruction (Henley, 1995), decision making (Klein, Calderwood & McGregor, 1989), error management (Dutke, 1994) incident reports (McGreevy, 1997), teaching and learning strategies (Bates & Obexer, 2005), accreditation standards (Prather, 2007) and air traffic optimisation (Gotteland, Durand, Alliot & Page, 2001).

The qualitative approach is acceptable for this research as passenger profiling is a newly developing area of research and as such, a flexible approach to the research method is required to capture detailed information that emerged during the collection stage and throughout the data analysis. Quantitative methods can be seen as a counterbalance to complement qualitative data.

4.1.2. Non Experimental
Non-experimental research explains the existence of phenomena without seeking to identify associations between cause and effect, whilst not having any control over participants (Wiggins & Stevens, 1999). Additionally, non-experimental research is used where problems need to be identified, which can then lead further research (Wiggins & Stevens, 1999). Non-experimental avenues of investigation include secondary records, field observations, case studies, task analyses, critical incident analysis techniques, epidemiology, meta-analyses, surveys/interviews and correlation
studies. Three avenues that are used in this research are secondary records, field observations and surveys.

A non-experimental approach has been chosen for this research, firstly because non-experimental methods are commonly used in the aviation field. Some examples of where non-experimental methods have been used in research include the investigation of visual illusions (Smith, Meehan & Day, 1992; Hull, Gill & Roscoe, 1982) and the investigation of human error (Shappell & Wiegmann, 1997). Secondly, a mixed method was chosen for this research due to the applied nature of the topic and because the participant responses cannot be controlled.

4.1.3. Survey

In deciding on the survey, it was important to maintain research accuracy in order for future research to be able to replicate this study. This thesis follows Cooper and Schindler’s (2003) format in this instance. Cooper and Schindler (2003) state that there are three bases from which to ensure the sound verification of research. These are checking the validity, reliability and practicality of the project.

Research validity refers to the way in which the data gained is an accurate measure of the variable under observation (Christensen, 1991; Goldstein, 1978, Wiggins & Stevens, 1999). In this case, the variable being investigated is the passenger’s perception of security within aviation and, from an observational viewpoint, the level of, and passenger reactions to, the security presence at international airports.
The design of the survey is a combination of Likert-type scales of items and a Discrete Visual Analogue Scale (DVAS). Likert categories presume the existence of an underlying (or latent or natural) continuous variable whose value characterises respondent attitudes and opinions along five lines of inquiry: Strongly approve, Approve, Undecided, Disapprove, and Strongly disapprove (Clason & Dormody, 1994; Likert, 1932). Likert (1932) noted that descriptors could be anything and that it is not necessary to have exacting negative and positive responses, by implying that the number of alternatives is also open to manipulation.

Likert-type categories on the other hand do not have exact opposites to their options (Uebersax, 2006). The options for Likert-type surveys must be reasonably interpretable to the researcher and the respondent and the options must be evenly spaced with labels which connote regulated graduations from one level to the next even if they do not have a clear ‘good’ ‘bad’ choice (Uebersax, 2006). Additionally, the items in a Likert-type scale do not seek agreement nor disagreement (Markusic, 2009). The 1-5 Likert-type scale used in this research uses a multitude of descriptors, dependent on the question being asked. For example, in Question 1, the 1-5 scale is:

1. Unsafe with or without security;
2. Unsafe because security is generally poor;
3. Safer because of better security;
4. Extremely safe because of better security;
5. Uncertain about security levels and effectiveness.

The DVAS classification method states that questionnaire responses are dictated by the respondent (Uebersax, 2006). This is seen in in Question 8, the five options are different, being:

1. 0-6 months;
2. 6 months – 1 year;
3. 1-3 years;
4. 4-6 years;
(5) 7+ years. Whilst the questions have adopted the traditional 1-5 scale, the descriptors vary.

Research reliability refers to the ability of the research to be replicated, given the same environment and the same stimulus (Bryman, & Cramer, 1994; Hunter, & Burke, 1994), along with the extent to which the research is free of error (Cooper, & Schindler, 2003; Wiggins, & Stevens, 1999). Reliability issues arise when there is ambiguity within the survey questions. This has been addressed by being explicit in their development.

In addition, other concerns affecting the reliability of the research are inconsistent responses. This has been addressed by framing the questions in such a way as to illicit the same answer (potentially) from two different questions. This was done by using the Prospect Theory (refer to point 4.2.4 Prospect Theory on page 89 for greater detail).

Research practicality refers to the economy, convenience and interpretability of the research (Thorndike & Hagen, 1969). Cooper and Schindler (2003) refer to practicality as the operability of the research as seen from the viewpoint of the researcher. The interpretation of results has been addressed by using a simple numbering system using an ordered category itemisation (Markusic, 2009). These items are 1 for Yes, 2 for No; 1 for male, 2 for female. This gives transparency to the structure. Further detail on the survey is included in point 4.3.5. Develop Survey on page 94.
Using mixed method surveys within an aviation environment and when conducting exploratory research is well founded. Surveys are used for descriptive, investigative, or explanatory purposes predominantly where the unit of analysis is the individual (Babbie, 1989). The survey will be investigating passenger perceptions on the use of security profiling of passengers for international air transport.

4.1.4. Investigative

Investigative studies are conducted when the area under research is relatively new and there are minimal known facts (Cooper & Schindler, 2003). In addition, it is employed so that research can uncover new data from which further research and a greater in-depth examination and level of knowledge can ensue (Champion, 2006). Maxfield and Babbie (2006) and Neuman and Wiegand (2000) state that the majority of research that deals with sensitive topics, and passenger profiling is one, is conducted via an investigative route. The linkage to this research is through risk perception. A study into passenger decision-making by Fischhoff, Bruine de Bruin, Perrin, and Downs (2004), showed that risk perception could be used to gauge the vulnerability of passengers’ personal risk thresholds before they travel.

An investigative design fits with qualitative data, as data gathering techniques are not associated with any particular method or theory and are used to develop a solid picture of what is occurring (Neuman & Wiegand, 2000). Hence, in terms of this research, an investigative study is being conducted in order to discover more about the travelling public’s perceptions of passenger profiling in aviation.
4.1.5. Observational

Observational research describes the systematic watching and recording of people and events to find out about behaviours and interactions (Mays & Pope, 1995, July 15). Observational research takes place in a natural environment; hence, it is a non-experimental method as there is no control over the participants (Mays & Pope, 1995, July 15). The use of observational research in aviation has centred on human factors and cockpit automation (Billings, 1996; Bruseberg, & Johnson, 2004; Damos, John, & Lyall, 2005).

According to Brown (n.d.) there are two ways to undertake observational research, direct (reactive) or unobtrusive (passive). Direct, or reactive, observation is conducted when the object under study is aware that they are being watched. An issue with direct observation is the Hawthorne Effect. The Hawthorne Effect is a positive behaviour modification due to knowledge that one is being watched (Babbie, 1989; Brown, n.d.; Cooper, & Schindler, 2003; Mays, & Pope, 1995, July 15; Roethlisberger, & Dickson, 1939). As the observations were conducted at international airports, the Hawthorne Effect does not apply, as those under observation were unaware of its happening.

The other avenue of observation is unobtrusive or being a participant observer (Mays, & Pope, 1995, July 15). This involves any method for studying behaviour where individuals are unaware that they are being observed and the researcher takes part in the activity. In such instances, the researcher may become a complete participant. For example, being a passenger on an international flight and having to clear customs and immigration at airports.
The observational method employed in this thesis is the unobtrusive participant observer. These observations are of the set up and flow of customs, immigration and passenger movement at various international airports (Sydney, Hong Kong, London - Heathrow, Taipei and Vancouver). The observations were taken during November 2007 and April 2008 by the researcher, who was a travelling passenger. These observations will be examined in Chapter 5: Results on pages 100-127.

As observational research involves watching and recording what people say and/or do, it relies heavily on the researcher to document the situation in-action. Therefore, it is vital that the observations are recorded through documented field notes written during, or immediately after the events, or by using audio or video recording facilities (Brown, n.d.; Mays, & Pope, 1995, July 15). In this case, the researcher used field notes taken immediately after the events.

In terms of this research, given that access to the aviation industry’s inner workings is difficult, the use of observational research, particularly the ‘participant observer’ role, is beneficial. It is because of this that observational methods are particularly well suited to the current study.

4.1.6. Inductive Reasoning
Inductive reasoning, or logic, is when a specific event is examined in detail and, from that, larger generalisations relating to similar events or situations, are able to be made (Champion, 2006). Neuman and Wiegand (2000) state that inductive reasoning begins with detailed observations of a phenomenon such as a topic or vague concepts.
about a situation, and from that, the researcher is able to generalise their ideas and observations relating to the rest of society.

An example of the inductive approach used in a qualitative study is Weatherford’s (1986) research into the impact of cocaine on rural Bolivian culture. Weatherford spent time in rural villages to examine the impact of the cocaine culture and discovered an exodus of local young males into the larger towns to work in the cocaine trade. Weatherford then determined that the transfer of labour from the smaller villages into larger towns resulted in an inability of the local townsfolk to produce enough food and thus ended up in a localised famine. Weatherford then theorised that if this was happening in this town, who’s to say that is doesn’t in other villages. This example highlights the ability of inductive reasoning to make generalisations from a specific event or action.

Likewise, this research is taking a specific topic, that of aviation security, and examining it in detail to derive a suitable conclusion from the observations that are made. In terms of this research, traveller opinions on passenger profiling are being sought by the researcher in order to gain a better understanding of the phenomenon so that generalisations and improvements can be made in regard to the practice of passenger profiling.

However, problems arise out of inductive reasoning as it is highly individual and the initial responses given to any topic such as aviation security can be highly emotive and can change according to the circumstances and situation that the respondent
finds themselves in. Issues with passenger profiling are discussed in Chapter 6 Discussion on pages 128-143.

4.1.7. Deductive Reasoning
Deductive reasoning involves using the scientific approach to profiling and uses logic as its base for justifying its actions. Deductive reasoning takes a situation and logically concludes that the offender’s characteristics are a direct result of the physical evidence of the crime (Petherick & Turvey, 2008, cited in Petherick, 2009). Deductive reasoning states that if the premise is true, then the conclusion must naturally follow to be true also (Petherick, 2009).

Therefore, using 9/11 as an example, the end result was the destruction of the World Trade Center in New York and the damaging of the Pentagon in Washington D.C. which then went on to cripple USA airspace for a period. Al Quada claimed responsibility so therefore, it would be logical to deduce that they were responsible for the acts of terrorism.

4.2 Theoretical underpinnings
This research utilises theories originating from the fields of criminology (the Routine Activity Theory and Rational Choice Theory), and decision making (the Protection Motivation Theory, Prospect Theory and the Information Integration Theory). These five theories are used to analyse the results of the survey. Each of these are now examined.
4.2.1. Routine Activity Theory
The Routine Activity Theory is a criminology theory stating that three elements are needed for a crime to take place. These are a motivated offender; the absence of a guardian; and a suitable target (Cohen & Felson, 1979). Hough (1987) furthered this theory, saying that a target must be based on proximity, accessibility and reward. The Routine Activity Theory proposes that for a successful criminal activity to take place there must be a convergence of all three elements (Clarke, 1997). A graphical depiction of the interaction of these three areas within the Routine Activity Theory is given in figure 4.2 below.

![Figure 4.2: Convergence of all three elements of the Routine Activity Theory](Source: Siegel, 2004, p. 93)

Analysing the events of 9/11 in terms of the Routine Activity Theory, Hudson (1999) considers terrorists to generally feel alienated from society and have a grievance or regard themselves as victims of an injustice (motivation). Additionally, there was a lack of airline or airport security to stop the action (absence of guardian), the symbolism of the World Trade Center in New York (suitable target) and the
crippling of the USA for three days (reward). Hudson’s (1999) alienation and grievance claims are supported by Gottfredson and Hirschi (1990) who state that grievances may result from built-up anger leading those in lower socio-economic ranges to turn to crime.

Analysing the Routine Activity Theory provides ample means to explain why such events occur and how to limit them in the future. To de-motivate the offending party, there must be ample opportunity for the achievement of aspirations. Sufficient disincentives must be in place to dissuade people from committing crime. Target suitability relates to its susceptibility to attack and its symbolism to the perpetrator and the victim. To lessen the suitability, the target must be unattractive to the perpetrators. If profiling causes a lack of desire to commit a crime, then it may provide an extra layer of protection to the aviation industry.

The Routine Activity Theory has been used in conjunction industry reports (European Commission Directorate-General Energy & Transport, 2007) as part of the data analysis.

4.2.2. Rational Choice Theory
The Rational Choice Theory states that offenders choose their crime after they have considered personal factors such as money, revenge or thrills; and situational factors like the availability of the target, security measures in place and any policing ability. Additionally, assessments are made on the likelihood of apprehension and the potential consequences of the action (Siegel, 2008).
Rational Choice Theory has been used extensively in criminology circles to assess a variety of behavioural instances (Dugan, LaFree & Piquero, 2005; Nagin & Paternoster, 1993; Piquero & Tibbetts, 1996; Wright & Decker, 1994; 1997). Dugan, LaFree and Piquero (2005) ascertained that using the Rational Choice Theory is an appropriate tool as many hijacking attempts are well planned and careful consideration is taken as to the risks and rewards of such an action.

There are four elements in the Rational Choice Theory that can be used to foresee violent activity. These are: (1) getting one’s way; (2) getting justice; (3) displaying power and (4) thrill-seeking (Felson, 2004). An individual will often try to get their way by influencing the behaviour of those around them in order to achieve personal goals. Specifically, violence may be used to achieve this purpose. Violence may also be used as a form of punishment aimed at getting justice. Black (1983) found that people often felt self-righteous and justified in their use of violent behaviour during disputes. In terms of displaying power, an example can be using violence to enhance or protect one’s identity, particularly involving one’s self-image. This may be seen as a form of “saving face”, or maintaining honour when one’s identity is challenged (Toch, 1980). Finally, thrill seeking. A desire for thrills and enjoyment of risk may provide yet another incentive for violence (Katz, 1988).

From an aviation perspective, the factors of getting justice and displaying power are the most important. Viewed from the perspective of 9/11, the use of aircraft as a tool of terror was an effective way to display power and induce global shock. In addition, the symbolism of the destruction of the World Trade Center in New York City was
an effective way of displaying the determination of the perpetrators to bring their struggle to light.

4.2.3. Protection Motivation Theory
The Protection Motivation Theory (PMT) relates to how people are most likely to protect themselves from harm when consequences are highest (Floyd, Prentice-Dunn & Rogers, 2000; Milne, Paschall & Orbell, 2000). This theory has been used in exercise motivation (Fruin, Pratt & Owen, 1991; Plotnikoff & Higginbotham, 1998), HIV/AIDS awareness and prevention (Umeh, 2004), coronary heart disease (Plotnikoff & Higginbotham, 2002) and supplementary dietary requirements (Cox, Koster & Russell, 2004).

This theory has been chosen because of the close relationship that has been formed between medicine and aviation, notably in system safety investigation (Sexton, Thomas & Helmreich, 2000), crew/staff resource management and communication (Maurino, 1999), and systemic error and hazard identification and reduction (Dunn, 2003). Additionally, the PMT has been applied in other circles such as crime (Cates, Dian & Schnepf, 2003) and industrial hearing protection (Melamed, Rabinowitz, Feiner, Weisburg & Ribak, 1996) which thus shows the dynamism in its application.

The PMT framework stipulates that the motivation to protect oneself from danger is based on five cognitive beliefs. These are: (1) perceived susceptibility; (2) perceived severity; (3) perceived effectiveness; (4) perceived barriers or obstacles; and (5) self-efficacy (Melamed, Rabinowitz, Feiner, Weisburg & Ribak, 1996).
The first function of ‘perceived susceptibility’ is an individual's estimation of their vulnerability to a negative outcome. From an aviation passenger perspective, the PMT can be applied through personal vulnerability within the confines of an aircraft. Passengers are inherently dependant upon the pilot for safe passage, and as such, they are vulnerable to any threat that may try to disrupt that safe passage. It is here where the passenger would feel most susceptible to threat due to his or her own personal lack of situational control. Goodwin, Willson, and Gaines Jr. (2005) noted in their investigation of terror threat perception in the United Kingdom that the general perception of any possible threats were predictors of behavioural change and had an immense bearing on decisions made by the travelling public.

The second point of the perceived severity of the consequences can relate to the potential for injury or harm to come to passengers (and crew). An aircraft hijacking can result in critical consequences for all involved. It is these unexpected events that passenger profiling could minimise by identifying and countering the threat on the ground before it has a chance to get airborne.

The third element is the ‘perceived effectiveness’ of one's ability to cope with and avert any threat or danger that may be imminent (Sturges & Rogers, 1996). An example may be a passenger needing to decide on whether or not to fly with an airline that may have an unreliable safety record or another airline that may cost more, but has a stronger safety record.

The fourth factor of ‘perceived barriers or obstacles’ to taking such action can be a major obstacle in taking any form of action. Research conducted by Fischhoff,
Bruine de Bruin, Perrin and Downs (2004) found that people are likely to cancel travel plans if their perception of risk is greater than their personal risk thresholds. This is supported by Loewenstein, Weber, Hsee, and Welch (2001), who found that affective responses can be useful in making people aware of risks and initiating their coping ability.

One such obstacle is the idea of one’s invulnerability to risk (Buch & Diehl, 1984; Telfer, 1988), or otherwise known as the mindset of ‘it won’t happen to me’ (Kunreuther, 2002). This perception of invulnerability can be hazardous in aviation and can be likened to Reason’s (1997) ‘unrocked boat’ syndrome. This phenomenon explains how safety standards can begin to decline unnoticed over a period of time as no incident or accident has occurred and there is no hint of any happening in the future. Safety levels fall even though they are thought to remain constant and are only exposed when a major accident occurs (Reason, 1997). An example of this is the Air New Zealand DC-10 crash into Mount Erebus in 1979 (Stewart, 1986). As the organisation had no accident history, there was no forewarning.

The concluding element of the PMT is ‘self-efficacy’, which is the subjective assessment of an individual’s own ability to perform essential tasks involved in a decision situation (Cho & Lee, 2006). Studies have shown self-efficacy to be the most powerful predictor of the intention and practice of behaviour (Kelly, Zyzanski, & Alemagno, 1991; Seydel, Taal, & Wiegman, 1990; Wulfert & Wan, 1993; Wurtele & Maddux, 1987). Self-efficacy can also influence how people assess the level of uncertainty in given situations (Krueger & Dickinson, 1994). Taking 9/11 as an example, passengers in one of the hijacked aeroplanes attempted to re-take control of
the aeroplane. This shows that there was a decision-making process that assessed the level of uncertainty in a situation and decided on a course of action.

This thesis uses the PMT as a data analysis tool. This has been done by a thematic analysis of the qualitative responses to see whether or not the responses coincide with any of the five factors of the Protection Motivation Theory.

4.2.4. Prospect Theory

The Prospect Theory (Kahneman & Tversky, 1979) concerns itself with decision-making under risk and states that decision are best made after the situation has been ‘framed’ (Mianelli, 2004, November). This framing concerns how a problem or situation is presented for solving (framed) and can have an influence on the decision made by an individual (Tversky & Kahneman, 1981). Others that have examined this include Highhouse and Pease (1996) Miller and Fagley (1991) and Schneider (1992).

For example, research by Cox, Cox and Zimet (2006) found that participants exposed to loss-framed messages exhibited a general aversion to risk. This therefore, supports the concept that how a question is framed influences the decision made. If the options are presented with a negative outcome, people are prone to avoid that option. Whereas if a negative outcome was posed in a positive light, then the decision may be the opposite. This indicates the importance of how the options to any given situation are presented or framed.

Prospect Theory outlines two steps in the process of choice. These are: editing and evaluation (Salvendy, 2006). In the editing phase, individuals analyse available
options and weigh each of them according to preference. During the evaluation stage, the edited choices are examined and a decision is made. Kühberger (1998) found that the influence in deciding an outcome is relative to the magnitude of the consequences. Therefore, if the decision has far-reaching consequences, greater care is needed in the preliminary analysis of choices.

The Prospect Theory as used in this research is centred on whether or not passenger decision-making is influenced by the level of airport and airline security. The design of the survey instrument follows the idea of ‘framing’. In the survey, there are three questions that ask the same thing, only in a slightly different manner. Thereby investigating how different answers, to almost the same question, can illustrate the importance of framing to the overall decision.

### 4.2.5. Information Integration Theory

Anderson’s (1971; 1981; 1991) Information Integration Theory (IIT) explores how attitudes are formed and changed through the integration (mixing, combining) of new information with existing cognitions or thoughts (Communication Institute for Online Scholarship, n.d.). In terms of this thesis, the new information relates to the introduction of increased security procedures such as passenger profiling.

The IIT states that when new information is obtained, it will affect an individual’s attitudes, but will not replace existing attitudes. Anderson (1981) bases the IIT on four concepts: stimulus integration; stimulus valuation; cognitive algebra and functional measurement. Research has determined that a single cause is rarely the reason why action is taken (Flinders University, n.d.; Queensland Health, 2007),
therefore, the integration of stimuli is required for action to be taken. Stimulus valuation is the relative value given to the stimuli by each individual. This is fraught with potential bias and as such is vulnerable to misinterpretation. Cognitive algebra is an elemental factor because “the human organism frequently appears to be averaging, subtracting, or multiplying the stimulus information to arrive at a response” (Anderson, 1981. p. 3). The final stage is functional measurement. This feature measures the results of the actions.

Considering this, when an individual is presented with new information, they will integrate this new information with their existing knowledge and assess whether or not it is feasible to continue on their current course. For example, if a passenger is required to arrive at the departure airport earlier in order to go through a more thorough security process prior to departure, they will assess whether or not they are prepared to do so. If they are, then they continue on with their plans. The individual’s opinion of the destination will not change, only the opinion of the departure point.

The Information Integration Theory has been used in this research in order to link the ‘new’ information that passengers have received regarding the heightened security requirements, to the ‘existing’ information relating to security threats. This is shown in respondent answers to Question 4 (a) and (b) of the survey. These results are noted as part of Chapter 5: Results on pages 100-127. The survey is also attached as Appendix C on page 179. It needs to be noted though, that the Information Integration Theory only expresses attitudinal change, not behavioural change. An attitudinal change does not, necessarily, correlate with a behavioural change.
Therefore, the overall impact of the attitudinal change on the passenger may not equate to any real change in their travelling behaviour.

4.3 Method

An overview of the thesis method process is given in Figure 4.3 below. The approach taken to answer the research question: ‘Will passengers accept passenger profiling, in its various forms, as a further way for authorities to increase aviation security?’ involved several steps. These were an initial data search, the development of the research question, the selection of the research design, the collection of the data, the development of the survey, distribution of the survey instrument and an analysis of the results.

![Figure 4.3: Thesis method overview](image)

4.3.1. Initial Data Search

At the commencement of this research in 2006, a comprehensive search for refereed academic journal articles relating to the topic of either passenger profiling or aviation security was conducted.

Academic articles that were found related to financial markets and management, airline industry financial risk, marketing, organisational behaviour and consumers and consumer marketing preferences. Some articles related to the potential bias of
airline passenger profiling, as well as the risk perception of terrorism on travel patterns. Scholarly papers, which did come up as related to the research, were dated in the early 2000s and as such are lacking in currency. At the conclusion of this initial data search, the formulation of the research question began in earnest.

4.3.2. Develop Research Question
At the conclusion of the initial data search, a research question was formulated, asking: Will passengers accept passenger profiling, in its various forms, as a further way for authorities to increase aviation security?

The research topic was chosen due to its relative currency. The area of aviation security and the introduction of passenger profiling systems is gathering pace on an international level. Further, the investigation of which has not been fully realised from a passenger perspective. The decision on the appropriateness of the research question has not been driven by theoretical underpinnings. Moreover, it is the lack of direct theory that was a contributing factor in the choice of research direction.

4.3.3. Select Research Design
After the research question was defined, the research design was finalised. As is examined at the start of this chapter, the research design used in this thesis is a mixed-method approach incorporating a number of different avenues of investigation.
4.3.4. Data Collection
The data collection process entailed a thorough review and search for any
documentation relating to passenger profiling and any issues that surrounded it. It
also involved asking questions such as: Who currently uses profiling? How do they
use it? What issues (if any) surrounded its introduction or acceptance? Would the
same things occur here in Australia? These questions formed the base of the data
collection process. The data was collected from a variety of sources in addition to the
survey, including academic and industry journals, government reports, newspaper
articles, observations and books relevant to the topic.

4.3.5. Develop Survey
The survey was conducted predominantly via a web-based interface. Web-based
interviews can include the use of e-mail, bulletin boards, or general website based
links (Berg, 2007) and are commonly used by researchers using surveys as their main
data-gathering instrument (Bachman & Shut, 2003; Champion, 2006). In the case of
this research, e-mail was used. This is because asynchronous environments such as e-
mail provide both the researcher and the participant time to collect their thoughts and
complete the survey when they best see fit. As Berg (2007) states, an e-mail sent
directly to a possible respondent cannot be altered by an outside factor, nor can the
respondent’s answers be viewed by the entire sample. This aspect of web-based e-
mail surveys enhances the privacy of the respondent. It is for these reasons that this
research is conducting an asynchronous web-based survey.
4.3.5.1. Participants
The survey received 265 respondents out of a total of 523 surveys distributed, giving a total response rate of just over 50%. The total number of responses is an amalgam of responses gained from the general public (n = 254) and responses from industry professionals (n = 11). Of this number, there were 158 males and 106 females. A total of 86.4% (n = 229) of the respondents were under the age of 33. The high number of respondents within the lower age ranges is a result of the data sourcing and is articulated in point 1.3 Limitations on page 4. This data is shown in Table 5.2 Frequency of age bracket on page 103.

The method of recruitment was accessing participants through the University of Western Sydney’s (UWS) internal travel department, as well as attending student lessons at UWS and at the New South Wales TAFE College at Ultimo in Sydney and students at the University of New South Wales. Student recruitment entailed addressing students at the conclusion of lessons and asking for their voluntary participation.

A further recruitment method was through attendance at an international conference on Racial Profiling at Borders, which was held in April 2008 in Vancouver Canada. The participants from this conference were all industry professionals, aged between their mid 30s to late 50s. The final recruitment method was by uploading the survey onto an industry association’s website. A web-based interface was used in this instance.

The data suggests that the majority of respondents (57.3%) [n = 152] travelled at least yearly. Given that the majority of respondents have been sourced from tertiary
institutions, once-yearly travel at least may be considered a high travel frequency for the respondents. This is shown in Table 5.7 *Respondent’s travel frequency relative to opinion on security* on page 107.

Additionally, Table 4.1 below indicates that the respondent’s main purpose of travel was for leisure, with 12.5% \( [n = 33] \) travelling for business, 82.6% travelling for leisure \( [n = 219] \). This would seem to indicate that the results may be tilted in favour of leisure travellers and not business travellers. Given that the respondents have been sourced from a tertiary education institution, this would not be out of place.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Business</td>
<td>33</td>
<td>12.5</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Leisure</td>
<td>219</td>
<td>82.6</td>
<td>95.1</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>7</td>
<td>2.6</td>
<td>97.7</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>5</td>
<td>1.9</td>
<td>99.6</td>
</tr>
<tr>
<td></td>
<td>6.00</td>
<td>1</td>
<td>.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>265</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.1: Type of respondent travel

4.3.5.2. Materials
This study utilised a structured survey. The purpose of having a structured process was to maintain control of the questioning and not go off on tangents unrelated to the survey purpose. The survey contained both open and closed questions. Each of the thirteen questions contained both a quantitative element (such as Yes/No), and a qualitative element (Why?). Having the qualitative element gave the respondents the opportunity to give their opinions on the question asked. Having both elements within the survey gave the researcher a greater opportunity to ascertain the true meaning of the answers, as the qualitative element can be used to confirm or
repudiate the quantitative answer. A copy of the survey instrument is attached as Appendix C on page 179.

4.3.5.3. Procedure
Each respondent had to fill out the survey as best they could by answering each question with an ‘x’ in the appropriate box along with a brief explanation of why they chose that answer. As the survey was voluntary, some respondents did not answer all parts of the survey.

Respondents sourced from TAFE and University students and industry participants at the international conference received an information sheet and consent form in-hand. The consent form needed signing and the Information Sheet outlined the purpose of the survey and the steps describing the process that the participant needed to undertake while completing the survey. The final piece of information given was the survey instrument itself. A copy of the Information Sheet is provided in Appendix A on page 177, while the Consent Form is in Appendix B on page 178.

For those participants on the internal UWS travel database, private contacts and sourced from the industry association, the documents were sent via electronic mail as separate attachments. Therefore, the respondent had to open their e-mail inbox and open each document one at a time to read over and understand the purpose of the research. For those who received the survey via email, a note was made on the survey consent form, informing the respondents that their consent is assumed if the researcher receives a completed survey. Many respondents who received their surveys via email did not return their signed consent forms. However, the researcher
is at liberty to use their completed surveys as part of the overall data collection, due to assumed consent.

For access to both the TAFE and University students at both Universities, the researcher first made contact with their teachers or lecturers and once approval for access to students was granted; the researcher attended their class and gave out the survey at the conclusion of the lesson. The researcher proceeded to inform the students of the purpose of the research and hand out the surveys. Students were free to accept or reject the survey as they saw fit.

4.3.6. Distribute Survey
The distribution of the survey proved to be quite difficult. Contact was made with a number of sources including two major travel agency groups, along with internet only travel portals as well as a local travel agency. After repeated attempts to organise a meeting no contact was reciprocated.

At this point, the method of data collection was reviewed and a decision was made to access the travel agency used by UWS who agreed to distribute the survey to everyone on their distribution list. Further, the researcher sourced respondents from the New South Wales Technical and Further Education (TAFE) system, as well as a student body from the UWS and the University of New South Wales. Over 160 replies were obtained in this fashion. Each response that was returned in-person was electronically processed into a personal computer for easier analysis at a future point. Contact was also made with an industry association to add a link to the survey on the Association’s website and the survey was uploaded onto their electronic newsletter.
Please refer to table 5.1: Source of respondents on page 102 for a breakdown of each individual participatory source.

In addition, the researcher attended a conference on ‘racial profiling at borders’ in Vancouver Canada in April 2008. From that conference, additional surveys were distributed and responses gained from academics who are researching in the area of profiling.

### 4.3.7. Analyse and Report Results

This analysis of results was broken into two parts, qualitative and quantitative. The qualitative analysis was done via a thematic analysis. The thematic analysis follows the themes of general, registered traveller schemes, profiling, complacency and then general observations. The registered traveller programme and profiling themes are continuing from a European Commission Directorate-General Energy and Transport [ECD-GE&T] (2007) report on the feasibility of the introduction of a registered traveller scheme within Europe and an Airports Council International (ACI) (2006, March) position paper on improving the pre-departure screening process for passengers. These themes were used as part of these reports’ data analysis.

A frequency and cross-tabulation quantitative analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 14.0 and is shown within each of the themes mentioned in the above paragraph. The results of which are analysed in Chapter 5: Results on pages 100-127.
Chapter 5: Results

Chapter 5 Results analyses results pertaining to the research question “Will passengers accept passenger profiling, in its various forms, as a further way for authorities to increase aviation security?” This chapter analyses both the data and respondent comments taken from the research survey. The data was collected during the period between 2007 and 2008. The data has been examined using a combination of cross-tabulations and frequency tables using version 14.0 of the Statistical Package for the Social Sciences software solution as well as a thematic text-based analysis of respondent comments in relation to theories and reports used in this thesis and observations conducted at five international airports. These are Sydney (Australia), Hong Kong SAR, London - Heathrow (UK), Taipei (Taiwan) and Vancouver (Canada).

The theories that have been used to analyse respondent comments are the Routine Activity Theory and Rational Choice Theory from criminology (refer to points 4.2.1. Routine Activity Theory and 4.2.2. Rational Choice Theory on pages 83-85 for greater detail). As well as the Protection Motivation Theory, Prospect Theory and Information Integration Theory from decision-making (refer to points 4.2.3. Protection Motivation Theory, 4.2.4. Prospect Theory, and point 4.2.5. Information Integration Theory on pages 86-91 for greater detail).

Additionally, two prominent industry reports have been used in the data analysis as a means of comparative results. These are a report commissioned by the European Commission Directorate-General Energy and Transport [ECD-GE&T] (2007) on the feasibility of the introduction of a registered traveller scheme within Europe and an

The ECD-GE&T (2007) report sought opinions from industry stakeholders in Europe relating to the introduction of a regional or singular European State registered traveller programme. The ECD-GE&T (2007) report is used in this research to support or negate respondent comments to the introduction and use of registered traveller schemes/programmes as a form of passenger profiling. The ECD-GE&T (2007) research is a counterbalance to the respondents from this thesis as this thesis focused on the general travelling public, whereas the ECD-GE&T (2007) report gained its data from industry participants.

The ACI position paper analysed deficiencies in pre-departure screening processes at international airports, putting forward a plan that included profiling as a means of eliminating these deficiencies. This industry report and position paper have been chosen for inclusion due to their relevance to the research topic and the prominence of their authorship.

This chapter is organised into five themes. These themes were chosen as the predominant areas to come out of respondent comments to the survey. The initial theme analyses the results from a general perspective, giving an overview of the total response rate and results relating to the overall perception of international air travel by way of security levels and delays experienced when travelling. The second theme analyses responses given in relation to registered traveller schemes. The third theme examines responses that refer to the use of passenger profiling. The fourth theme
analyses potential complacency of the respondents. While the fifth theme discusses security process observations made by the author at five international airports.

### 5.1. General Questions

In total, there were 265 respondents out of 523 distributed surveys, giving a total response rate of 50.67%. This high response rate may possibly be attributed to the heightened interest that the public have in aviation security at this time (2006-2009) because of the impact of 9/11 as well as the targeted nature of the sample. Table 5.1 below indicates the source of respondents to the survey and shows the total number of returns relative to that which was distributed.

<table>
<thead>
<tr>
<th>Source</th>
<th>Number</th>
<th>Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>UWS</td>
<td>190</td>
<td>16</td>
</tr>
<tr>
<td>Personal</td>
<td>68</td>
<td>35</td>
</tr>
<tr>
<td>ST UWS</td>
<td>148</td>
<td>148</td>
</tr>
<tr>
<td>ST UNSW</td>
<td>78</td>
<td>31</td>
</tr>
<tr>
<td>ST TAFE</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>AIPA</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Conf</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>523</strong></td>
<td><strong>265</strong></td>
</tr>
</tbody>
</table>

**Key:**
- UWS = University of Western Sydney - Staff
- Personal = Private contacts
- ST TAFE = NSW TAFE Students
- ST UNSW = University of New South Wales Students
- AIPA = Australian International Pilot's Association
- Conf = Conference attendance – Vancouver 2008
- ST UWS = University of Western Sydney Students

Table 5.1: Source of respondents

Table 5.2 Frequency of age bracket shown below gives a breakdown of the frequency with which the respondents were classified into the five age brackets that were part of the survey. From this table, it can be seen that the highest percentage of
respondents were classified in the 18-25 age bracket. This may have been because
the majority of respondents were sourced from tertiary educational institutions.
However, this does not discount the importance of the result as this age group, whilst
being in the younger end of the spectrum, will have to deal with the consequences of
any profiling programmes the longest therefore their opinions on the topic are
especially sought.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>203</td>
<td>76.6</td>
<td>76.6</td>
<td>76.6</td>
</tr>
<tr>
<td>23-33</td>
<td>26</td>
<td>9.8</td>
<td>9.8</td>
<td>86.4</td>
</tr>
<tr>
<td>34-41</td>
<td>18</td>
<td>6.8</td>
<td>6.8</td>
<td>93.2</td>
</tr>
<tr>
<td>42-49</td>
<td>9</td>
<td>3.4</td>
<td>3.4</td>
<td>96.6</td>
</tr>
<tr>
<td>50 +</td>
<td>8</td>
<td>3.0</td>
<td>3.0</td>
<td>99.6</td>
</tr>
<tr>
<td>N/A</td>
<td>1</td>
<td>.4</td>
<td>.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>265</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.2: Frequency of age bracket

Of the 265 responses, one did not answer the gender question. Of the remainder, 60
percent were male, and 40 percent were female. This creates a skewness in the
results with male responses being a ratio of 1:1.5. This is illustrated in Table 5.3
below. This may indicate that from the sample of 265, either, males are more readily
willing to give their opinions and females are more reluctant, or, that due to the
industry being male dominated, there is a reduced likelihood of gaining female
perspectives.
The results of Question 1 ‘What is your current view on security (safety) in international air travel?’ revealed that the majority of respondents consider the aviation climate as it stood during the years between 2007 and mid 2008 to be safer than in previous times as shown in Table 5.4 below.

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>158</td>
<td>59.6</td>
<td>59.6</td>
<td>59.6</td>
</tr>
<tr>
<td>Female</td>
<td>106</td>
<td>40.0</td>
<td>40.0</td>
<td>99.6</td>
</tr>
<tr>
<td>N/A</td>
<td>1</td>
<td>.4</td>
<td>.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>265</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.3 Total numbers relative to gender

Table 5.4: Respondent’s views on security

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsafe with or without security</td>
<td>13</td>
<td>4.9</td>
<td>4.9</td>
<td>4.9</td>
</tr>
<tr>
<td>Unsafe because security is generally poor</td>
<td>16</td>
<td>6.0</td>
<td>6.0</td>
<td>10.9</td>
</tr>
<tr>
<td>Safer because of better security</td>
<td>164</td>
<td>61.9</td>
<td>61.9</td>
<td>72.8</td>
</tr>
<tr>
<td>Extremely safe because of better security</td>
<td>16</td>
<td>6.0</td>
<td>6.0</td>
<td>78.9</td>
</tr>
<tr>
<td>Uncertain about security levels and effectiveness</td>
<td>56</td>
<td>21.1</td>
<td>21.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>265</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.4 above indicates that the majority of respondents (61.9% n = 164) consider option three (3) ‘Safer because of better security’ to be the most appropriate. Reasons behind this answer are supported by statements given by the respondents. This is best shown in the quotation below.
“The current security measures limit quite drastically what a passenger may take on board the aircraft, thus reducing risk of security related safety breach. Furthermore the use of limited cockpit entry has also greatly reduced the airborne risk.”
(Respondent 47, 2007)

Respondent 47’s (2007) comments show that people are acknowledging the risk reduction methods now being used within aviation. However, some respondents, although acknowledging that they felt safer with the increase in security levels, were dissatisfied with the imposition that the increased security had on them. For example:

“I think it has become a little more safer due to the extensive security checks but it is also annoying.”
(Respondent 18, 2007)

Respondent 18’s (2007) comment above may agree with the overall premise that security has improved and that the respondent feels safe whilst flying. Although, Respondent 18’s (2007) comment also shows that even though they may feel secure, they may be unwilling to accept certain inherent requirements of those increased levels. For example, the imposition of having stricter security checks prior to boarding the flight. As Respondent 18 (2007) points out, the increased security measures are ‘annoying’ for this traveller. This may illustrate that this respondent feels that the increase in airline security should be handled differently.

Further examples of potential passenger annoyance at the increased levels of security are given in Question 2, which asked ‘Would you travel less frequently (nationally or internationally) if there are further security impositions that would result in more delays?’ Table 5.5 below shows a cross-tabulation of the answers given in Question 1 relative to the frequency of travel if there were to be an increase in delays due to increased security.
Table 5.5: Travel frequency relative to an increase in delays at airports

Results from Question 2 shown in Table 5.5 above, would indicate that a majority of respondents (80% n = 212) would not change their travel patterns if there were an increase in delays at airports due to heightened security. Comments like those that are reproduced below were common.

“I’d prefer better security to ensure my safety rather than shorter queues [sic] and weaker security.”  
(Respondent 210, 2008)

“I am quite happy with waiting longer to ensure overall security measures are maintained.”  
(Respondent 241, 2007)

These two responses by Respondent 210 (2008) and Respondent 241 (2007), are a reflection of the majority of respondents who stated that they would not change their travel patterns if security were increased. Table 5.6 below indicates that the respondents feel prepared to undergo further security screening if their flight was safer, even if it meant an increase in delays.

Table 5.6: Further security measures relative to the frequency of travel
When looking at the data and considering the frequency with which the respondents travel and their views on security, it can be seen in Table 5.7 below, that the majority of respondents, regardless of travel frequency consider the current security regime to be safer than previously.

<table>
<thead>
<tr>
<th>Count</th>
<th>ViewOnSecurity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsafe with or without security</td>
</tr>
<tr>
<td>Frequency</td>
<td>6 monthly</td>
</tr>
<tr>
<td>yearly</td>
<td>2</td>
</tr>
<tr>
<td>every 18 months</td>
<td>1</td>
</tr>
<tr>
<td>2-4 years</td>
<td>5</td>
</tr>
<tr>
<td>4+ years</td>
<td>1</td>
</tr>
<tr>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 5.7: Respondent's travel frequency relative to opinion on security

Therefore, the overall general response to the questions was that people are willing to have an increased level of security screening even if it meant a corresponding increase in delays prior to departure because the passenger would be assured, as much as can be, that they are safe. Additionally, the overall response is an acknowledgement that there has been in marked increase in security levels at airports prior to departure and that the respondents realise that is it required to maintain a level of safety and security. In contrast, this feeling was countered by the results relating to the use of registered traveller schemes.

5.2. Registered Traveller Schemes

Contrasting the willingness of passengers to undergo further security measures came from the results relating to Registered Traveller Schemes or programmes. Question 5 of the survey asked ‘Do you think a form of ‘trusted traveller’ or ‘registered
traveller’ scheme where passengers undergo a background check and are given an identity card in lieu of having to pass through security every time they travel should be introduced to safeguard passengers from threats?’. Results to this question indicated that although the respondents were happy to undergo further security measures, they were not in favour of any form of registered traveller or frequent traveller scheme. This is shown in a tabulation of results in Table 5.8 below.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>112</td>
<td>42.3</td>
<td>42.3</td>
<td>42.3</td>
</tr>
<tr>
<td>No</td>
<td>142</td>
<td>53.6</td>
<td>53.6</td>
<td>95.8</td>
</tr>
<tr>
<td>Both</td>
<td>8</td>
<td>3.0</td>
<td>3.0</td>
<td>98.9</td>
</tr>
<tr>
<td>N/A</td>
<td>3</td>
<td>1.1</td>
<td>1.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>265</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.8: Acceptance of a registered traveller scheme

The results indicate that the majority of respondents to this question of the survey would be cautious to accept any form of registered traveller scheme (53.6%, n=142). The statistical significance of the responses to this question [t (264) = 1.891, p = 0.0597; p>0.05] would indicate that there is negligible statistical significance with the answers to this question. However, the data obtained from this question contradicts that of the previous question on the acceptance of increased security measures. This may lead to the point that even though people may be willing to have further security screening, if an authority were to actually attempt to introduce such a scheme there may be resistance from the general public.

This stance is supported by a cross-tabulation of gender responses of “yes” or “no” to whether or not they would accept a registered traveller scheme (shown in Table 5.9 below). The data illustrates that of the total respondents, relative to gender, a very
slight majority of both males and females (57.7% \[n=82\] and 41.5% \[n=59\] respectively) are against the introduction of a registered traveller scheme in Australia.

<table>
<thead>
<tr>
<th>Gender?</th>
<th>Male</th>
<th>Female</th>
<th>N/A</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>What Is Your</td>
<td>71</td>
<td>41</td>
<td>0</td>
<td>158</td>
</tr>
<tr>
<td>Gender?</td>
<td>82</td>
<td>59</td>
<td>1</td>
<td>106</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5.9: Gender responses to registered traveller scheme acceptance

The data in Table 5.9 above relating to the introduction of registered traveller schemes shows that 42% of all respondents \[n=112\] are in favour of a registered traveller scheme, while 53% are against the idea of a registered traveller scheme. This would suggest that there is not much difference of opinion on that question. However, this sample is merely a small representation of the entire travelling public.

In terms of theoretical analysis, the data gained through the survey primarily concerns the absence of a guardian and motivated offender elements of the Routine Activity Theory as well as the likelihood of apprehension factor in the Rational Choice Theory and the perceived susceptibility, perceived severity, perceived effectiveness, and perceived barrier elements of the Protection Motivation Theory.

Having a lack of capable guardians is the primary factor in the activity of crime as outlined in the Routine Activity Theory of criminology. Additionally, the likelihood of apprehension from the Rational Choice Theory is also an important factor in terms
of criminal activity. As pointed out by survey respondents, one way in which guardians can be duped and apprehension can be avoided or severely limited is to create a false identity and use it to gain acceptance into the registered traveller scheme. Comments below by Respondent 106 (2008), Respondent 178 (2008) and Respondent 213 (2008) articulate the concern of identity theft/fraud that can undermine the integrity of registered traveller schemes.

“People can forge documents, so checks each time travelling would be safer.”
(Respondent 106, 2008)

“Would result in increased identity theft etc. Wouldn’t work.”
(Respondent 178, 2008)

“Although it would be a good idea, criminals would eventually (probably) find a way to infiltrate the system with identity theft etc.”
(Respondent 213, 2008)

The point of false identity also arose from the ECD-GE&T (2007) report. A key finding from this report was that people might create false identities or documentation in order to avoid security detection at airport screening points (ECD-GE&T, 2007). The creation of false identities to gain acceptance into a registered traveller programme has the potential to give criminals a feasible avenue of possibility to carry out their plans. This point needs mitigating to strengthen the perception of registered traveller schemes as a viable option of airport security.

The point of false identification can be transposed into the first and second elements of the Protection Motivation Theory. These elements of the Protection Motivation Theory are the ‘perceived susceptibility’ of an individual to a given negative outcome; and the perceived severity of the consequences. This severity can relate to the potential for injury or harm to come to passengers. In terms of registered traveller
schemes, the idea of passengers creating false identification to thence gain entry and cause damage to an aircraft creates a level of personal susceptibility with potentially severe consequences.

The creation of false documentation can result in inaccurate watch lists. In addition, it is supported by the ECD-GE&T (2007) report. A key finding from this report stated that in order for registered traveller schemes to be successful, it is imperative that the information held within the registered traveller scheme’s databases and government watch-lists be constantly updated to avoid a false apprehension of an innocent passenger.

The inaccuracy of governmental watch lists is a further way for criminals to avoid apprehension. This point is again linked to the lack of a suitable guardian as outlined by the Routine Activity Theory as well as being a further way to reduce the likelihood of apprehension in terms of the Rational Choice Theory of criminology. This is because one way authorities assess passenger risk, is via information gathered from government watch-lists. If that watch-list is incorrect, then there is greater chance of non-apprehension or mis-apprehension. This is supported by comments shown below from Respondent 265 (2008), Respondent 223 (2008) and Respondent 133 (2008) in this research relating to the inaccuracies of watch list maintenance in a registered traveller scheme.

“Only if background check is updated regularly.”
(Respondent 265, 2008)

“Checks may miss something.”
(Respondent 223, 2008)
Because people can change their motives & people can also lie during their background check.
(Respondent 133, 2008)

Comments above from respondents 265, 223 and 133 (2008) again point to the importance of government oversight and regular checks of the data held by the registered traveller scheme to maintain their accuracy as a thorough pre-acceptance background check may reduce the likelihood of unlawful acts. However, these comments also highlight the extraneous influences on people that may eventuate out of being part of the registered traveller scheme. These influences may alter their motives to act once they have access to an encapsulated environment such as an aircraft cabin and emphasise the need for constant updating of the information held in order to reduce this possibility.

Additionally, these comments above are sustained by the fourth factor of the Protection Motivation Theory, ‘perceived barriers or obstacles’ to taking such action. The barrier to entry in this instance is the perception that the watch-lists may hold out of date information that could result in a passenger’s wrongful apprehension. It is important to maintain watch list precision as the watch-list is the primary means of indentifying passengers who may be a threat. If the watch list is not maintained with up-to-date information, then possible wrongful apprehensions could ensue.

A way for criminals to potentially avoid apprehension in terms of the Rational Choice Theory is via the use of terrorist sleeper cells or clean skins. These people may have a perfect background profile yet intend to conduct terror-related activities once they have been cleared by the initial background checks used in registered
traveller programmes. Comments shown below by Respondent 41 (2007), Respondent 136 (2007) and Respondent 138 (2007), gained through this research relate to sleeper cells or clean skins.

“There have been examples of perfectly sane people with blemish free backgrounds committing crimes in society. Why would this not necessarily happen in aviation. Who’s not to say that one of these ‘safe travellers’ might have an off day and take advantage of their privilege / responsibility?”
(Respondent 41, 2007)

“A determined group could find a “clean skin” to perform a terrorist act with no trouble at all.”
(Respondent 136, 2007)

“In my head I would say yes, but what about sleeper cells etc (terrorists) that may be laying in wait for years before they react.”
(Respondent 138, 2007)

These comments above show that the public are aware of sleeper cells and so-called ‘clean skins’ that may be intent on causing harm. The notion of sleeper cells and clean skins was illustrated in the ECD-GE&T (2007) report. A key finding from this report stated that sleeper cells or clean skin terrorists might gain acceptance into registered traveller schemes before waiting to act. Additionally, Australian authorities are cautious about registered traveller schemes because of potential sleeper cells as they demonstrate the latency that terrorists can have (Turner, n.d., cited in Joint Committee of Public Accounts and Audit, 2004).

The final point on avoiding apprehension in terms of the Rational Choice Theory is the possible coercion of general passengers into carrying out acts of violence. Felson (2004) mentioned coercion when they illustrated that the Rational Choice Theory can be used to foresee violent activity based on the criminal getting one’s way by influencing those around them through threats of violence or coercion. Comments
reproduced below from Respondent 23 (2008), Respondent 249 (2008) and Respondent 144 (2008) from this research indicate that the coercion of passengers to carry out acts of violence is a factor in the negativity surrounding the introduction of pre-screened registered traveller schemes.

“Could be abused/trusted travellers bribed to take things through security.”
(Respondent 23, 2008)

“People change, anything can happen to influence or corrupt them.”
(Respondent 249, 2008)

“Because they might be honest then be bribed into doing something.”
(Respondent 144, 2008)

These comments show that the survey respondents are aware of possible coercion once accepted into a registered traveller scheme. The use of coercion of innocent passengers by criminals can also be linked to the first element of the Protection Motivation Theory, perceived susceptibility. This is because general passengers who are part of a registered traveller scheme could be susceptible to coercion by another passenger to carry out unlawful acts. The Routine Activity Theory states that there needs to be a motivated offender in order for a criminal act to take place. In this instance, the coercion of passengers who have been pre-profiled and accepted into the registered traveller scheme by criminals.

Coercing or duping passengers into carrying out acts of violence was also cited in the ECD-GE&T (2007) report. A key finding from this report stated that any form of pre-screening of passengers for inclusion into a registered traveller scheme does not discount the possibility of those passengers being coerced by financial incentive (or otherwise) to carry out acts of violence against airports/airlines.
The ECD-GE&T (2007) report’s concluding remark was that precise criteria for the risk assessment of passengers used in registered traveller schemes can be extremely subjective and open to interpretation (ECD-GE&T, 2007). This finding from the report is supported by Respondent 36 (2007) who stated:

“Hard to see what criteria could be used with a reasonable chance of identifying risks. Such a scheme is more likely to perpetuate privilege and that makes it open to abuse.”
(Respondent 36, 2007)

Additionally, a watch list or database is not a definitive measure of lower passenger risk because the passenger may not yet be on the list when assessed for acceptance into the registered traveller scheme (ECD-GE&T, 2007). This is supported by respondents in this research who state that their opposition to any form of registered traveller scheme is based on the notion that people are unpredictable and that the system can be manipulated to serve the needs of terrorists. Comments by Respondent 16 (2008), Respondent 54 (2008) and Respondent 78 (2007) indicate this, as reproduced below.

“Because people could travel frequently & be good & then get their identity card & then carry unsafe weapons etc cause [sic] they know they wont [sic] get checked.”
(Respondent 16, 2008)

“How do you know you can trust them in the future?”
(Respondent 54, 2008)

“Because you never know what this person up to in near future.”
(Respondent 78, 2007)

The above statements from the respective respondents identify the importance of trust that is inherent in any form of registered traveller scheme. It also corresponds to the first element of the Protection Motivation Theory, perceived susceptibility. These respondent comments also point to the matter of trust. Trust can be defined as set of
attitudes and expectancies about other people and the organisational systems within which they are embedded (Jeffcott, Pidgeon, Weyman, & Walls, 2006). From an aviation perspective, these organisations could be government departments. Comments above from Respondent 16 (2008), Respondent 54 (2008) and Respondent 78 (2007) also identify the lack of trust that that may be an issue with any possible introduction of registered traveller schemes.

This counters the claim by Pons (2006) and Daignault, Shepherd, Marche and Watters (2002) who suggest that, from a marketing perspective, consumers are willing to place their trust in certain organisations and large, identifiable companies with strong brand recognition. Although not a point within this thesis, the notion of trust is important for aviation security as the travelling public place implicit trust in the prevailing authorities to provide a safe mode of transport. Trust may be a possible future research direction.

All of these elements and points mentioned (using a false identity, inaccurate watch lists, sleeper cells, clean skins, coercion, the subjectivity of risk assessment and finally trust) indicate respondent’s possible unwillingness to accept registered traveller or trusted traveller programmes unless there are strict provisions on data review and pre-screening acceptance. This in-turn may indicate that they are also unwilling to be profiled for increased security. The may have a negative influence on the introduction of passenger profiling. Initiatives to introduce registered traveller programmes as a form of passenger profiling, as can be read in the preceding paragraphs may prove to be futile.
5.3. Profiling

An analysis of the respondent’s comments relating to profiling has been conducted using industry reports completed by the Airports Council International (2006, March) and the ECD-GE&T (2007) report as well as the Information Integration Theory which is used in decision-making (refer to point 4.2.5 Information Integration Theory on page 90 for greater detail). In summary, there are four factors within the Information Integration Theory: stimulus integration; stimulus valuation; cognitive algebra; and functional measurement (Anderson, 1981). The element of stimulus integration has been used in the analysis of respondent comments relating to profiling.

The stimulus integration element, when related to this research, has been interpreted as the integration of information regarding increased security levels and their perceived need. In this research, the increased security level is the use of passenger profiling. Stimulus integration was the premise of Question 4 (a) ‘What different approaches to security do you think authorities should do to safeguard passengers from threats’. When asked this question, many respondent comments echoed the point that profiling may be a positive step to improved aviation security. Comments from Respondent 51 (2008), Respondent 200 (2008), Respondent 44 (2007) and Respondent 257 (2008) respectively shown below indicate that there is an awareness of passenger profiling and their personal desire to have it introduced.

“advanced profiles on passengers @ time of booking.”
(Respondent 51, 2008)

“Profiling, whether it is PC or not. Behind the scenes monitoring would assist.”
(Respondent 200, 2008)
“Definitely, traveller profiling would be a fantastic time-saver both for regular travellers, and for those who travel infrequently, because it would reduce waiting times considerably at all the various check-points one has to pass through.”
(Respondent 44, 2007)

“Profiling passengers at time of booking (as ELAL Israel carrier does). Especially last minute passengers without known security clearance (APEC card etc, or ASIC holder/confirmed airline staff pax.).”
(Respondent 257, 2008)

These above comments show that the respondents were agreeable to the concept of passenger profiling. This is supported by research conducted by the ACI (2006, March) who found that security processes at airports only focus on weapons detection, rather than detecting people who have malicious intent and that security emphasis should be placed on profiling passengers in order to identify those that may pose a greater risk. Additionally, the ECD-GE&T (2007) report found that profiling could be effective in identifying passengers who pose a significant security threat. When asked how these improved security measures may be accomplished (Question 4(b)) the same respondents commented saying:

“Establish profiles of all air travellers (nationality, place of birth, travel history, occupation).”
(Respondent 51, 2008)

“Databases developed from existing police etc data sources would enable good profiling.”
(Respondent 200, 2008)

“Other benefits of profiling should be screening for medical issues (airlines not diligent enough here (Post operative travel, age, known breathing difficulties).”
(Respondent 257, 2008)

These comments by the respondents to both Questions 4(a) and 4(b) show that profiling passengers to improve aviation security may be an acceptable change as it would speed up the check-in process and improve security levels which in-turn make the travelling public feel safer.
Using the stimulus integration element of the Information Integration Theory, it can be surmised that once passengers have incorporated new information – that security levels need improving (comments to Question 4(a)) then they are openly agreeable to offer suggestions on how that should be accomplished (comments relating to Question 4(b)). The respondent’s comments that profiling should be introduced is a direct result of new information gained via mass media sources that claim aviation security needs improving.

Also related to stimulus integration is Question 6 ‘Would you be willing to undergo further security checks if it meant an increase in security for the flight and thus a greater chance of you arriving at your destination safety’. Results to this question, shown in Table 5.10 below show that 78.8% [n = 209] of the respondents are willing to undergo further security checks.

<table>
<thead>
<tr>
<th>Count</th>
<th>What Age Bracket Are You In?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18-25</td>
<td>23-33</td>
</tr>
<tr>
<td>Would You Undergo Further Security?</td>
<td>Yes</td>
<td>164</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>5</td>
</tr>
<tr>
<td>Both</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>N/A</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 5.10: Willingness to undergo further security checks relative to age

The results from Question 6 show that the majority of respondents (78% or 209 out of 265) were in favour of undergoing further security. When examined further, it can be seen that 88% (or 184 out of 209) were aged below 33 years. Both of these results further strengthen the point that the respondents are in favour of increased security measures; however, the form that those measures take still needs investigation.
Additionally, one of the limitations of this thesis is the relative age of the majority of respondents. As seen in table 5.10 above, 88% are aged below 33 years. This presents an imbalance in the results. This is because most of the data collection was taken at tertiary institutions in Sydney Australia. However, this research has merit precisely because of this limitation. It is gaining perspectives from an age bracket of society that must manage the repercussions of any such introduction.

Each of the above questions (Questions 4(a), 4(b), 5 and 6) relate to the respondent’s opinion on increased security. Analysing the combined results of Questions 4(a), 4(b), and 6, it would indicate that respondents would not be displeased if there were to be a passenger profiling system introduced as a measure of increased security and that respondents are willing to undergo greater security screening.

This however, contradicts the comments from respondents and from the theories used to assess the concept of the introduction of a registered traveller scheme relating to Question 5, which was examined earlier in this chapter. That assessment concluded that respondents are unwilling to have a registered traveller scheme, along with the inherent increase in airline security, as registered traveller schemes can potentially be exploited by terrorists. This poses a dilemma. In one instance there are calls for increased security and passenger profiling, whilst in the other, respondents to the survey are unwilling to undergo further security checks due to a possible perceived misuse of the system.

Therefore, the respondents were contradictory in their answers. This could possibly relate to how the question has been ‘framed’ in order to illicit a response. This is the
premise of the Prospect Theory. The way in which a problem or situation is presented for solving (framed) impacts upon the final decision made (Mianelli, 2004 November; Tversky & Kahneman, 1981) (refer to point 4.2.4. Prospect Theory on page 89 for greater detail). It can be seen here that the way the question has been framed for answering did indeed have an influence on the resultant answer.

5.4. Complacency

Another issue that rose from the respondent comments was the possible inferred xenophobia and complacency which related to the manner of responses to Question 7 ‘Which of these destinations do you consider safe to travel to and why?’ Question 7 had five options a) Sydney; b) Tokyo, c) New York; d) London; e) Paris; and f) Other destination where respondents could write in their own choice of destination. Results shown in figure 5.1 illustrate that of the options given to the respondents; a good majority consider Sydney to be the safest airport, with Tokyo a close second.

Xenophobia is a morbid dislike of foreigners (Oxford University Press, 1952). In terms of this research, the comments given in Question 7(a) could be construed as a form of reverse xenophobia in that the comments given by the respondents do not claim to dislike foreigners, but proclaim Sydney (their home city) as being the safest airport. This perception of safety may be debatable after an altercation at Sydney’s domestic terminal in March 2009, which has led authorities to question the adequacy of security at Sydney’s Terminal 3 (O’Brien & Creedy, 2009, March 24).
There were 172 comments out of the 245 responses to Sydney being considered a safe destination. Of those 172 comments 25% (n = 43) specifically stated that Sydney is safe and justified their position with the claim that ‘I live here’, or they are ‘locals’, or they ‘know’ that the Sydney airport is safe verbatim. In addition, comments such as these below by Respondent 136 (2008), Respondent 211 (2008) and Respondent 261 (2008) all indicate that there is a perception that Sydney is a safe destination.

“No reason to think otherwise.”
(Respondent 136, 2008)

“Big city – a lot of security.”
(Respondent 211, 2008)

“In Australia, security is taken very seriously. Furthermore, Australia in general still presents a low risk.”
(Respondent 261, 2008)

These comments and the high percentage of respondents who consider Sydney safe, brings into consideration the notion of risk perception. Rundmo (2000) stated the risk
perception is an assessment of the likelihood of experiencing a negative outcome while being exposed to a hazardous situation. In this instance, the likelihood of experiencing a negative outcome (i.e. terrorism) does not seem to enter into respondents considerations. This could be due to potential complacency on the part of the respondents because Sydney is their home city and as such consider the level of security to be adequate for all emergencies.

According to Cho and Lee (2006) and Wogalter, Young, Brelsford and Barlow (1999) people base their risk perception on the potential for injury relative to the level of uncertainty and the significance of consequence. From the respondent comments above and the high percentage of responses claiming that Sydney is safe because ‘I live here’ (referred to in the above paragraphs), it could be interpreted that in the minds of the respondents, there is a lack of consequence and therefore no risk at Sydney airport. In addition, risk perception is altered once new information is gathered regarding a situation (Dowling & Staelin, 1994; Srinivasan & Ratchford, 1991). This links to the Information Integration Theory and supports the notion that people make decisions once incorporating new information into their current knowledge base before deciding on a course of action.

5.5. Observations

In addition to the data gained via the research survey, this thesis also employed the use of observational methods. The observational method employed was as an unobtrusive participant observer. The researcher used field notes taken immediately after the events on the passenger security processing and customs and immigration clearance procedures. Refer to point 4.1.5. Observational on page 79 for greater
detail and discussion on observational methods. Observational methods were used to compare Respondent comments with the literature review.

Participant researcher observations were taken at Sydney international airport, Hong Kong international airport, London (Heathrow) international airport, Cheng Kai Shek international airport in Taipei and Vancouver international airport during November 2007 and April 2008 and are grouped according to departure & arrival process, customs clearance and security presence.

5.5.1. Departure & Arrival Process
The departure process at each of the airports (Sydney, Hong Kong, London (Heathrow), Taipei (Cheng Kai Shek) and Vancouver) was essentially the same and involved two steps. In step 1, I, as the participant researcher had to fill out a departure card and have it, and my passport stamped or scanned by an immigration official at the immigration counter. Step 2 involved proceeding through the security screening point where all metallic possessions (mobile phones, jewellery, and watches) as well as cabin bags were scanned. Once I passed immigration, I was free to peruse the terminal duty free shops.

The only airport that was different was Vancouver. For my departure from Vancouver, after checking in my bags, I proceeded to go through the security screening point, and that was all. No immigration and customs border check. This may be because Canada has a land border with the United States and is more concerned with illegal immigration via that route, rather than through air travel.
Upon arrival, again, the process is similar and involves customs and immigration clearance and baggage collection. The only variations to this were at Taipei and Hong Kong. On my arrival into Taipei, passengers are greeted with a large sign saying “The importation, possession and trafficking of illegal drugs into or through the R.O.C. is punishable by death”. This would, and did, indicate to me, a passenger, that security in relation to drug trafficking is taken very seriously in Taiwan.

While in Hong Kong, each passenger was instructed to remove all hard objects such as watches, belts, jewellery, coined money, wallets etc, as well as all backpacks and coats also went through the x-ray screening.

These observations show the similarities in approach to the departure and arrival process for passengers. Relative to the research topic, profiling could be integrated into the immigration clearance step. This would be an unobtrusive, covert way of increasing the soft security measures. This would make people think that the level of security is merely what they see around them, rather than what is behind them.

5.5.2. Security Presence
The only observable security levels were at Heathrow, Taipei and Vancouver. Security levels noticed upon arrival into Heathrow were minimal. Only three heavily armed police were observed at the exit of the building. Although there were CCTV security cameras everywhere, so instead of being a ‘hard measure’, such as armed personnel which is visible, London seems to have adopted something more akin to what is termed ‘soft measures’ which relates to security being masked in order to maintain the element of surprise.
Having measures of this type can easily accommodate the introduction of profiling. The CCTV cameras could be used for facial recognition and can assist in authorities’ attempts to apprehend suspected threats. However, the levels of security on departure from Heathrow were different. All metal objects were scanned as well as all wallets, bags, coats and other loose clothing, which had to be placed through the x-ray scanner. Additionally, passenger’s shoes are scanned separately. Therefore, it would seem that security levels at Heathrow are higher.

This corresponds with the results of question seven of the survey, shown in figure 5.1 on page 118. These results illustrate that 119 out of the 265 responses (or 44.9%) consider Heathrow to be a safe airport. This result may be due to the multiple security techniques used.

The observable level of security personnel at Taipei was intense. There were 10 heavily armed security guards within the main customs and immigration hall. This alone was enough to make me, as a passenger more alert to things and be more vigilant with my actions, as well as feel more secure in the knowledge that security is taken very seriously at the airport.

This contrasts with Vancouver. There seems to be quite strict control over who can come into the country, but very little (if any) at the departure end of the equation. I had been told by those who attended the conference that Canadian customs are stricter on departures to the USA via land. As the greater Vancouver area literally
crosses the USA-Canada border, there is a greater emphasis on land-based immigration, rather than air-based.

5.6. Summary
The results indicate that respondents consider aviation security stronger than in previous times. Nevertheless, the respondents gave contradictory responses to implementing increased security measures. The respondents did support an in-principle use of passenger profiling, but were undecided on the implementation process. This was shown by the limited support given in the survey to the use of registered traveller programmes, as used in Europe. Respondents agreed that such registered traveller programmes would not be accepted in Australia due to the lack of trust that the travelling public have for the authorities that would administer the programme.
Chapter 6: Discussion

6.1. General Discussion

The early implementation stages of passenger profiling in Europe and the USA have highlighted numerous issues for authorities to overcome. These issues have included racial bias (Siggins, 2002), data security (Swartz, 2004a; 2004b) and access and privacy issues (DHS, 2008a; 2008b). From a review of the literature, these issues can be resolved. For this to be accomplished, adequate safeguards need to be built into the passenger profiling programme.

The introduction of passenger profiling can help to improve an airline or airport’s defences against unwanted threats, by supplementing existing threat management frameworks. Within the literature, this has been illustrated by the USA, which has introduced several variations of passenger profiling systems over time with various levels of success, in an attempt to increase their own border security levels (Poole & Passantino, 2003; Subcommittee on Aviation, 2002; Swartz, 2004b; TSA, n.d.a).

Likewise, from an Australian perspective, the introduction of profiling may be integrated within the existing security framework. This can be done under the main legislative instruments governing aviation security within Australia, which are the Aviation Transport Security Act 2004, the Aviation Transport Security Regulations 2005 and the Crimes (Aviation) Act 1991. Notably, under section 64AF of the Customs Act 1901 (as amended), (Commonwealth of Australia, 2005), if an airline is requested by Australian Customs and Border Protection to provide PNR data on passengers entering Australian airspace, the airline must acknowledge the request.
and provide it. Also under section 16 of the Customs Administration Act 1985 if information is accessed under this request, that information cannot be freely disclosed to others outside of those directly needing it (Data Protection Working Party, 2004a). That is, that the information can only be accessed by authorised personnel as a direct result of the performance of their duties.

This inbuilt restriction safeguards the unauthorised access to personal information. Therefore, the implementation of a passenger profiling system within the current security framework in Australia can be accomplished. Furthermore, with an increase in the level of security and the technology needed for that to be achieved, comes greater potential for co-operability with other countries that have already instituted some form of passenger profiling strategies within their aviation security framework.

The USA and the EU have been formulating a framework for the transfer of passenger data between these two regions since 2003 (Commission of the European Communities, 2003; EU and U.S. agree..., 2004; European Commission, 2004; Meller, 2003). An agreement was finalised between the USA and EU to allow the free flowing of PNR data while maintaining data protection during 2006 (Deutsche Welle, 2006, October 6). Under this agreement, shared information from the PNR records are held within an airline’s reservation system (European Communities, 2004). A major obstacle towards this agreement had been the issue of data privacy. European privacy legislation is exacting when relating to access (Swartz, 2004b). Concerns were raised about the possible dilution of those standards should a reciprocal agreement of access with the USA be enacted. As this potential sharing of passenger information runs counter to those privacy laws (Creedy, 2004, December)
and would not give EU citizens any option for redress against unlawful targeting in the USA (Swartz, 2004b).

Talks between the USA and EU stagnated on this point. Whilst there remain concerns over the limits on data retention and the right of access to that information (European Communities, 2004), the agreement was accepted. These latest developments in Europe and the United States can prove to be a precursor to any potential changes in Australia. As such, the introduction of measures similar to the US-VISIT or Privium programme in the Netherlands cannot be ruled out.

The remainder of Chapter 6: Discussion is grouped into the areas of Registered Traveller Programmes, Biometrics, Vulnerabilities, Perceptions, Risk and Privacy. These areas were chosen due to their importance to passenger profiling as well as their thematic emergence during both the literature review (see Chapter 2: Literature Review on pages 21-48 for more detail) and data analysis (see Chapter 5: Results on pages 100-127 for more detail).

6.2. Registered Traveller Programmes
The most common examples of profiling to come from the literature were in the form of registered traveller programmes. The literature illustrated multiple examples of registered traveller programmes, in various forms, operating around the world. However, survey respondents shown in Table 5.8 on page 108 stated that they were not prepared to accept any form of registered traveller programme (53.6%, n=142). With this in mind, Australian authorities may need to evaluate alternate or less intrusive avenues, should they choose to introduce a profiling programme in
Australia. The simplest method may be to access an existing airline’s passenger database.

Using existing data held in current frequent flyer programmes to create a registered traveller scheme may possibly be achieved with minimal disruption to passengers. This information would need to be validated at the travel agency each time the passenger books an air ticket. If bookings are done over the internet, then an extra step in the internet booking process may be added in order to include a note relating to the update of personal information in the airlines frequent flyer database. The information would be verified by a government agency. If the information is correct, the passenger is accepted into the programme, if it is incorrect, then they are declined entry into the programme.

Once accepted, when the passenger presents for check-in, they would swipe their frequent flyer card through a card-reading device at the counter. The card would be verified and the passenger would then proceed to a dedicated screening area before being forwarded to the aircraft-boarding gate. The use of this system would negate the requirement for lengthy security clearances. Similar to an individual’s credit card being recognised and read in foreign countries, a passenger’s frequent flyer membership card could be recognised and read at multiple airports. However, this would only be valid if a passenger was flying with partner airlines.

This proposal has been adapted by the Australian airline Qantas, which has just announced that it is introducing an enhanced boarding process for its silver and platinum frequent flyer members. This new system employs smart-card technology,
allowing passenger’s frequent flyer cards to act as a boarding pass. Passengers will “swipe their frequent flyer card on a reader and head to a simplified baggage drop, or straight through the security process to their departure gate or Qantas lounge,” (Joyce, cited in O’Sullivan, 2009, November 21).

If the use of frequent flyer data is unfeasible, there are other options available such as biometric identification. However, the access of data accumulated for these programmes remains a strong point of opposition, especially the area of data reciprocity.

6.3. Biometrics

The introduction of biometric check-in procedures (either in an ePassport or in fingerprint boarding technology) is intended to address two industry-wide problems. One of these is increased security and the other is excessive time delays during check-in. Precise Biometrics consider fingerprint boarding as the future of aviation security because it provides both an additional identification measure and the ability to reduce check-in waiting times. This reduction is accomplished via the use of wireless mobile phones (Precise Biometrics, 2008b). This biometric solution enables fingerprints to be both stored and matched inside a passenger’s mobile phone SIM card. When the passenger uses the mobile phone at the gate to check-in, the fingerprint information is transmitted to the SIM card and matched against the reference fingerprint inside the card (Precise Biometrics, 2008b). At the time of writing, biometric solutions were being trialled at Amsterdam’s Schiphol airport to examine how the use of mobile phone check-in affects passenger-waiting times at check-in and boarding (Precise Biometrics, 2008b).

Passengers can book a flight, select a seat and board the aircraft all through their mobile phone (Armstrong, 2008). If the passenger’s telecommunications carrier supports quad-band frequencies and the passenger has a quad-band compatible mobile phone, a bar-coded itinerary is e-mailed to their phone. Upon reaching their departure gate, machines located in front of the security screening point read the bar code directly from the mobile phone (Japan Airlines, 2005). The passenger is then free to proceed to the aircraft. Passengers using the ‘Touch & Go’ system from JAL do not need to queue at an airport check-in counter or to use a self check-in machine. This system is being used in 44 airports across Japan (Japan Airlines, 2005). This is contrasted with the ANA system where passengers are still required to hold a printed boarding pass from airport security (Armstrong, 2008).

Using any form of profiling system brings with it vulnerabilities that may or may not have been considered during the developmental states of the programme.

6.4. Vulnerabilities
Experiences in countries such as the USA have shown that passenger profiling is fraught with vulnerabilities (Alberto & Bogatz, n.d.; Persico & Todd, 2005; Weitzer
One such vulnerability experienced in the USA and arose during the data collection process is discriminatory screening. Opponents of profiling claim that it is an ineffective security measure resulting in illegal discrimination and violation of individual rights (Alberto & Bogatz, n.d.).

While profiling has been outlawed as a technique for USA border control, it may still be used in circumstances where national security is thought to be at risk (Department of Justice, 2003). This outlawing was brought about because of concerns over the assumption that people of one racial or ethnic background are more liable to commit offences than people of other races or ethnicities (Department of Justice, 2003). This point is reinforced in research by Weitzer and Tuch (2002) who found that people who have been stopped by law enforcement based on their race, view profiling as a widespread practice and expressed dissatisfaction with society.

This brings to light profiler bias. One issue that the CAPPS II system in the United States had to overcome was bias, which had civil libertarians resentful over its use (refer to point 2.1.2. CAPPS II on page 23 for greater detail). Even though better targeting may decrease the incidence of potential criminal activity, more proficient detection techniques such as profiling does not necessarily equate to a decrease in the overall crime rate (Persico & Todd, 2005). Research conducted by Persico and Todd (2005) discovered that improvements in profiling techniques reduced the probability of racial bias and thence reduced the likelihood of apprehending passengers on false grounds.
A further issue is that individuals with their own biases administer the profiling programme. Therefore the development of a profiling ‘target list’ and the classification of attributes sought by profilers for that list, is difficult. The isolation of attributes or traits shared by offenders is a formidable task (Hudson, 1999). Post (1985) noted that behavioural scientists researching the psychology of individuals drawn to violent behaviour could not identify a unique “terrorist mindset” (p. 103). Post (1985) also discovered that people who have a motivation to enact violent behaviour tended to be from a wide range of cultures, nationalities, and ideological causes, all strata of society, and diverse professions.

Laqueur (1987, p. 129) holds that the search for a “terrorist personality” is fruitless as individuals seeking to disrupt society, can emerge from widely divergent spheres of national and socio-cultural backgrounds, contexts, and goals. This then strengthens the hazards of making generalisations and attempting to develop a profile of individuals and of groups (Hudson, 1999).

Therein lays the issue concerning profiling. It is difficult to reach agreement on a quantifiable list of attributes containing all the absolutes in terms of personal behavioural attributes that potential criminals may have. This is because when dealing with humans, errors are always made and judgements on what is and what is not classified as a threat can come down to the individual’s personal perception of what constitutes a threat.

Furthermore, a person who “fits the profile”, can potentially circumvent security checks by planting an incendiary device such as an explosive device or similar, on
someone who does not fit the profile while in areas of high passenger traffic movement areas such as toilets or airport gates. Respondent comments to such vulnerabilities were inconclusive, with some stating in-principle support for profiling, while others claiming that it is fraught with issues such as bias and can be altered. Profiling is under-inclusive for this very reason. A profile alone does not establish suspicion (Alberto & Bogatz, n.d.). However, it can alert authorities to the potential for criminal activity. All of these vulnerabilities are influenced by an individual’s perception of how they fit within the world around them. How people perceive profiling is an important element in understanding its faults.

6.5. Risk
Risk perception plays an integral role in the decision-making process of passengers (Cho & Lee, 2006). Risk perception concerns the psychological and emotional aspects that can affect a person’s behavioural stance of a situation (Slovic, 2000). Risk perception is influenced by several factors including age (Furnham & Saiepe, 1993; McFadden & Towell, 1999), gender (Reason, Manstead, Stradling, Baxter, & Campbell, 1990), level of confidence (Weinstein, 1980) and personality traits (Deery, 1999). Risk perception is particularly important after an aviation incident because of the potential for the public to have a negative emotional reaction to the prospect of flying.

According to Dowling and Staelin (1994), risk perception motivates the decision maker to engage in a particular behavioural manner. For example, a passenger’s perception of risk towards flying can be higher after an airline accident because of perceived personal safety vulnerability in such circumstances.
This is intensified by a passenger’s inability to have any control over their situation whilst in an aircraft cabin (Parker, 2006). This is due in part to the knowledge gap between the pilot and passenger and the tight confines of the aircraft cabin, through which the transaction of travel takes place. Passengers are therefore inherently dependent upon the pilot for safe passage, and as such are vulnerable to any threat that may try to disrupt that safe passage. If there are any threats to the aircraft whilst in flight, the pilots should be made aware of the situation so that they can then decide on a relevant course of action (Berkley & Ala, 2001).

Passenger risk perception in relation to aviation, can be likened to what Grose (1995) identifies as the subconscious concept of ‘implicit trust’ that a passenger places in a pilot once on board an aircraft. Parker (2006) claims that the lack of control that passengers have once in an aeroplane, can affect their perceptions of safety. In order to alleviate this, research has shown that passengers engage in an extensive information search to lessen their fears when flying (Dowling & Staelin, 1994; Srinivasan & Ratchford, 1991). This statement supports Dowling and Staelin’s (1994) and Srinivasan and Ratchford’s (1991) research that people manage risk by increasing their knowledge base in order to gain a better understanding about a given situation so that they can come to a satisfactory solution to that given situation.

Goodwin, Willson, and Gaines Jr. (2005) noted in their investigation of terror threat perception in the United Kingdom that the general perception of any possible threat were predictors of behavioural change and had a bearing on decisions made by the public. This is supported by Fischhoff et al, (2004) who found there was a change in
the behaviour of the travelling public after 9/11, with people cancelling their travel plans, resulting in a sudden downturn in travel activity post 9/11.

Rundmo (2000) claims that risk perception is a subjective assessment of the likelihood of experiencing a negative outcome while being exposed to a hazardous situation. From an aviation perspective, the likelihood of a negative outcome such as terrorism or acts of air rage could be lessened by the introduction of passenger profiling. Thus, reducing airline and passenger risk (Ghobrial & Irvin, 2004).

Respondents to the survey supported an in-principle application of extra security measures, as shown in Table 5.10 on page 119 with 78.8% (n = 209) of the respondents willing to undergo further security checks. However, respondents were divided over the possible privacy issues that may arise.

6.6. Privacy
The privacy of passenger’s personal information emerged as a major point of discussion throughout a large portion of the literature (Barnett, 2004; Curry, 2004; Ghobrial, & Irvin, 2004; Gould, 2002; Swartz, 2004a) and during the data analysis process in Chapter 5: Results. Concerns centred on the requirement to access personal information in order for any passenger profiling system to be a success. Personal information is considered as any kind of information that can be used to identify a person including name, address, telephone number or date of birth (Allens Arthur Robinson, 2008). Public unease over government access to private information has been a long-standing issue with profiling programmes in the USA.
(Swartz, 2004a; 2004b). Respondent’s survey comments illustrated that if people have nothing to hide, then why should they oppose such measures.

To counteract any potential public unease over the accessing of private information, any agreement that Australia may enter into needs to adhere to the Privacy Act 1988 (Commonwealth of Australia, 2007). The Privacy Act prohibits Australian government officers from collecting, using or disclosing private information except in the performance of their duties and obliges them to take all reasonable steps to prevent any form of unauthorised access, modification or disclosure (DFAT, n.d.; Commonwealth of Australia, 2007).

Information that may be included in a potential passenger profiling system is illustrated in Table 6.1 below. The data in the below table is based on the data reciprocity preliminary agreement between the USA and the EU (Council of the European Union, 2007).

| Information gathered from passengers for security profiling |
|-----------------|-----------------|-----------------|
| 1 Full Name     | 10 Destination  |
| 2 Date of Birth | 11 Onward Destination (if any) |
| 3 Passport Number | 12 Date of Arrival in Foreign Country |
| 4 Home Address   | 13 Date of Departure of Foreign Country |
| 5 Home Phone Number   | 14 Medical Condition (if any) |
| 6 Foreign Address  | 15 Gender |
| 7 Foreign Phone Number | 16 Income |
| 8 Place of Work    | 17 Frequency of Travel |
| 9 Work Phone Number | 18 Last Visited Destination |

Table 6.1: Information gathered for a passenger profiling system
The use of similar elements in any potential Australian system may enhance system interoperability between Australia and other countries to allow easier flow of passenger information for security purposes.

The use of these eighteen elements in Table 6.1 as part of the data collection process for a passenger profiling system allows it to be interoperable with other profiling systems around the globe. As mentioned in the above paragraph, similar elements are used in passenger profiling systems used in the USA and EU. Additionally, elements relating to date of departure and arrival, onward destination, frequency of travel and last destination, can give authorities a firm grasp on the movements of the passenger and whether or not their movements are via destinations considered suspect. This does however, open the profiling system to privacy issues.

Privacy issues in the USA and EU centred on the security of the data once it has been accessed. Evidence exists that data security is a major obstacle to the development and implementation of a passenger profiling programme (Alberto & Bogatz, n.d.; Data Protection Working Party, 2004a; 2004b; European Communities, 2004).

Further, the right of access to data remains an area of concern to authorities (EU and U.S. agree on air traveller data, 2004). This has emerged during the literature review as a point of contention in the development and implementation of passenger profiling programmes. This is mostly due to the private nature of the information being accessed and the perception of an invasion of a passenger’s personal privacy.
This issue was of paramount importance in the agreement on PNR data transfer between the USA and the EU. Europe was hesitant in agreeing on a PNR transfer because it was unsure which USA organisations had right of access to the data they were seeking (European Commission/US Customs Talks on PNR Transmission, 2003; Swartz, 2004b).

Limits placed on the usage and storage of information gathered and accessed needs to be addressed due to the potential for exploitation of such information for purposes other than for which it was originally intended. One possible solution would be to include a disclaimer within the system. For example, when an airline ticket is booked, it may be advisable to have a clause in the ticket conditions. This clause would note that information gathered in the process of booking may be used by the relevant authorities to gain a ‘picture’ of the traveller and use that picture to gauge the security risk of that passenger to the overall safety of the flight.

In line with issues of access to data, the point of editing that data if it is outdated is another matter. Concerns have been raised in the USA over editing obsolete data. Instances have transpired where citizens where wrongly apprehended by law enforcement agents because they did not have up-to-date data on the person they arrested (Cole, 2003).

The two areas of privacy and security safeguards are related to a further issue, that of data sharing. Data sharing is done in order to ascertain if there are any passengers on board who may be of interest to the authorities, or pose a risk to the safety of the flight (Swartz, 2004b). Data sharing in this instance is the transference of private
passenger information between two government authorities, for the purposes of a PNR transfer. For example, PNR data collected at the departure point and electronically transferred to the arrival destination before the arrival of the passengers is done to identify passengers who may be of interest to authorities, or pose a risk to the safety of the flight. The type and usage of the data is of most concern to privacy advocates (Swartz, 2004b).

The issue of data sharing is important. There have been attempts to curb the amount and type of data shared between organisations. In terms of passenger profiling, it is the number and type of items requested that caused most concern amongst the travelling public (Commission of the European Communities, 2003; Data Protection Working Party, 2004a; 2004b; Swartz, 2004b). In order for a passenger profiling programme to be accepted, issues surrounding data sharing need resolution.

6.7. Summary

Chapter 6: Discussion sought to examine the results obtained in Chapter 5: Results with that of the literature. From the literature, the predominant methods of introducing passenger profiling systems have been via the implementation of registered traveller programmes and the introduction of biometric identification methods at airports.

This chapter has concluded that survey respondents have answered the research question ‘Will passengers accept passenger profiling, in its various forms, as a further way for authorities to increase aviation security’ with a mixed response. Respondents do support the acceptance of increased security measures. However,
respondents illustrated areas that concern passengers regarding profiling systems, not least of which is the inability to define a definite set of traits that are applicable to all potential offenders, which can then be used for precise targeting and apprehension. Additional issues centred on potential breaches of privacy and the ability of the information to be accessed and doctored for use outside of the scope of the passenger profiling programme.
Chapter 7: Conclusion

The after-effects of 9/11 brought about a significant change within the air transportation industry, with direct repercussions on airline profitability (ICAO, 2004). One avenue followed by governments to reduce the threat of such actions in the future included forms of passenger profiling. The aim of this research was to assess passenger perceptions of the increase in aviation security levels at airports and whether or not new measures such as passenger profiling, would be accepted by the travelling public. This research was conducted by first examining the relevant academic and industry literature on the topic, before gathering opinions from the travelling public on the state of aviation security. The research focused on answering the question of ‘Will passengers accept passenger profiling, in its various forms, as a further way for authorities to increase aviation security’.

7.1 General Conclusions

This research has looked at the literature relating to forms of passenger profiling that are currently in use around the world. Chapter 2: Literature Review highlights the various approaches to passenger profiling used as an avenue of increased security within the global aviation industry, as well as discussing the procedures and practices available to authorities to introduce passenger profiling. These included PNR access, the introduction of registered traveller schemes and the use of biometric identifiers as part of border control. The research provided a solid understanding of the issues surrounding the introduction of passenger profiling programmes and how they have been overcome outside Australia.
Numerous issues were identified through the introduction of passenger profiling systems in a number of countries. Whilst the survey results indicate that passengers do consider it safer to fly since the introduction of stricter security measures, they are also unsure as to the need to introduce further measures such as passenger profiling. The most prevalent issue that arose was that of access, storage and use of a passenger’s personal information gathered for the profiling programme. Other issues identified were the inherent vulnerabilities of passenger profiling systems to operator bias and the risk of passenger data being utilised for purposes other than those intended. It was discovered that this unease was in part due to the lack of trust that the travelling public have with the authorities who would be administering the programme.

Further areas of concern from respondents involve the proliferation of registered traveller programmes and the introduction of biometric identification methods at airports, as well as the inability of authorities to define a common set of traits, applicable to all potential offenders, to be used for precise targeting and apprehension.

Additionally, respondent comments relating to the level of security at various international airports suggest that all of the airports chosen for the survey were perceived as safe. However, the final option for the respondent to add their own airport and comment on it showed that most respondents chose an Eastern Oriental or Middle Eastern location and commented that it was unsafe. Most respondents indicated that Sydney (their hometown) was regarded as safe.
7.2. Future Research Directions

7.2.1. National Identity Cards
The rapid uptake of profiling measures such as biometrics and registered traveller programmes across the globe has brought to light related areas of possible future research in relation to profiling, including the possible introduction of national identity cards. National identity cards are already in place in countries such as Hong Kong (Immigration Department, 2007) Portugal and Thailand (Precise Biometrics, n.d.a; n.d.b.). Likewise, the United Kingdom introduced voluntary biometric identity cards for foreigners in November 2008, with mandatory identification cards for all citizens from 2012 (Identity and Passport Service, 2009). In Australia, calls for a national identification card, titled the ‘Australia Card’ began in the 1980s (Greenleaf & Nolan, 1986), with the question resurfacing in the wake of 9/11.

Further research is needed in this area as national identity cards may not only simplify the application of a passenger profiling programme by having all the information in one easily accessible place, but could also allow authorities to cross-check information a lot quicker and make it more difficult for people who wish to cause harm to be anonymous. This is because all the information about a person will be held in one location, accessible by all departments so the ability to falsify information is reduced.

7.2.2. Regional Interoperability
Passenger profiling also has the potential to enable Australia to be part of the broader approach in strengthening the global aviation/transportation industry. Australia’s aviation security network could possibly be incorporated into a more pan-continental
approach using profiling and advanced passport identification methods as the tools of integration (JCPAA, 2004).

The integration of Australia’s security framework into a more regionally orientated one can broaden the fight against criminal activity, not only in the aviation sphere, but also in other areas of both law enforcement and border protection through data integration. One avenue for the enhancement of regional interoperability could be the use of radio frequency identification.

### 7.2.3. Radio Frequency Identification

With fingerprint check-in being applied by various carriers (Scandinavian Airlines Sverige, 2008), there is a wider move by the global aviation industry for greater involvement of technology in passenger check-in. This includes Radio Frequency Identification (RFID), wireless technology, and mobile phone check-in and locator ability. Radio frequency identification is a form of wireless technology that employs radio waves to identify people and objects (Copenhagen Airports, 2008).

Research has shown that the use of RFID technology within aviation is predominantly for baggage and vehicle tracing (making up 80% of all usage between the two of them) (Harrop, 2006). Its use within aviation security could encompass such things as movement monitoring via a mobile phone trace locator through wireless portals within the terminal. Mobile phone check-in and tracking is currently used at Copenhagen airport and by Air New Zealand (IER, 2008). The introduction of RFID can be beneficial in two ways. It can be integrated with fingerprint technology currently used during the check-in process by SAS, and secondly if a
passenger fails to board the aeroplane, then their luggage is removed from the aeroplane as per normal practice.

In summary, respondent comments from this thesis research indicate that there is a mixed reaction to passenger profiling. On the positive side, profiling is thought to increase security, with respondents willing to undergo further security checks. Conversely, there are concerns over the amount of data and information that would be needed to implement the programme and the potential social implications of moving towards the general monitoring of people’s movements.

Therefore, regardless of global industry trends showing an increasing awareness and usage of forms of passenger profiling, should Australian authorities introduce security profiling into the Australian aviation system, further research is required of the options available to authorities so that a more ‘rounded’ view can be obtained. This extended research can be used to assist authorities in the decision made regarding whether or not to implement profiling as a further security measure, can balance the requirements of industry with the social and political concerns of the travelling public.
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**Glossary**

**Advanced Passenger Information** (API): This system transmits information to immigration authorities of the country of destination prior to a passenger’s arrival in order to expedite the passenger’s clearance. This data can include information about passengers, crew and those remaining in transit (Airports Council International, 2006, March; Department of Immigration and Citizenship, 2007).

**Air Marshalls**: Law enforcement officers responsible for protecting air passengers and crew in the event of an attempted hijacking while in the air (Transportation Security Administration, n.d.c).


**Australian Customs Service**: The Australian government department that protects Australia’s borders via the interception of illegal drugs, firearms, high-risk aircraft, vessels, cargo, postal items and travellers through intelligence analysis, computer-based analysis and various other technologies (Australian Customs Service, 2007a).

**Biometrics**: Biometrics is the analysis of biological data such as a fingerprint, voice, face and features of the eye’s iris to confirm an individual’s identity (ComSec Enterprises, 2007).

**Booking Reference Number** (BRN): The equivalent of a PNR although the Booking Reference Number is used more often on electronic tickets.

**Computer Assisted Passenger Prescreening System** (CAPPS I): A passenger profiling system that was discontinued in the United States. This system used data contained in a passenger’s PNR (Cavoukian, 2003).

**Computer Assisted Passenger Pre-screening System II** (CAPPS II): A passenger profiling system that was discontinued in the United States. This system used passenger information collected by the travel agent upon reservation. This information was then checked against government and commercial databases, to determine the level of security screening per passenger (Ghobrial & Irvin, 2004; Government Accountability Office [GAO], 2005, Matthews, 2002).

**Decision Making**: The process that individuals take when having to decide on a choice or course of action through the acquisition and interpretation of stimuli before actioning an appropriate response (Dalcher, 2002; March, 1994; 1997; Weick, 1995).

**Department of Foreign Affairs and Trade** (DFAT): The Australian government department that administers the issuance of travel visas and biometric passports (Australian National Audit Office, 2003).
Department of Immigration and Citizenship (DIAC): The Australian government department that is primarily responsible for the entry and exit of foreign nationals into Australia and to assist with settlement if they so wish (Department of Immigration and Citizenship, 2007).

Department of Infrastructure, Transport, Regional Development and Local Government (TReDLoG): This Australian government department advises the Government on policy and regulation for Australian airports and the industry as well as administering the legislative requirements of the aviation industry to maintain compliance with the International Standards and Recommended Practices of the International Civil Aviation Organisation (Office of Transport Security, 2005).

Discourse Analysis: analysing data collected from a wide range of sources to generate texts able to be analysed from a particular viewpoint theoretical frame including interview transcripts, newspaper articles, observations, documents, or visual images (Cheek, 2004).

ePassport: A Biometrically enhanced passport document that contains micro-chipped data to enhance border security (Department of Foreign Affairs and Trade, n.d.).

Ex post facto: A Latin term meaning after the fact (or event).

Express Entry: A registered traveller scheme in place at Israel’s Ben Gurion airport, which uses hand-geometry to validate the traveller’s identity using hand, finger or retina recognition (Electronic Data Systems Corporation, 2007a).

General Strain Theory: A sociological criminal theory stating that individuals under stressful conditions are more likely to experience negative emotions like anger, fear, and frustration (Agnew, 1992).

Hierarchy of Control: A risk management measure used to treat organisational or industrial risks by ranking five (5) risk control measures in decreasing order of desirability and effectiveness (Monash University, 2007).

Identity Services Repository: A single data store that retains and tracks identity information, including passenger biometric data, which was obtained during their visa application and entry processing (Department of Immigration and Citizenship, 2007)

Inductive Research: Inductive research is conducted when a specific event is examined in detail and from that, larger generalisations can be made relating to similar events or situations (Champion, 2006).

Information Integration Theory: This is a decision making theory that explores how attitudes are formed and changed through the integration (mixing, combining) of new information with existing cognitions or thoughts (Communication Institute for Online Scholarship, n.d.).
**Information Privacy Principles** (IPPs): A set of governing principles concerned with the access of records containing personal information (Data Protection Working Party, 2004a).

**International Civil Aviation Organization** (ICAO): the regulatory body for international civil aviation which oversees the safe and orderly growth of international civil aviation throughout the world (Bartsch, 1996).

**Investigative Research**: Investigative studies are conducted when the research area is relatively new and there are minimal known facts (Cooper & Schindler, 2003).

**Mixed-Method Research**: Mixed-method research uses data gathered from a number of sources including academic journals and government publications, books, interviews or observations (Corbin & Strauss, 1990).

**Movement Alert List**: A list used by authorities that contains details about persons who are of interest to Australian authorities and/or pose a risk to the security of the country (Australian National Audit Office, 1999).

**Multi-Layered Approach**: An approach to security such that any attempts to breach the industry defences are blocked on many levels before it can reach the critical stage whereby an incident could occur (Joint Committee of Public Accounts and Audit, 2004).

**Non-Experimental Research**: Explains the existence of phenomena by providing descriptions of certain variables (Wiggins & Stevens, 1999).

**Observational Research**: research done by systematically watching people and events to find out about behaviours and interactions in natural settings (Mays & Pope, 1995, July 15).

**Passenger Name Record** (PNR): A number reference that travel agencies, airlines and other authorities can access which containing details about individual travellers. These details can include, but are not limited to, name, date of birth, address, home and work contact details, itinerary, flight companions and method of payment. More common in paper ticketing systems.

**Passenger Profiling**: The analysis of a passenger’s past actions via information gained by a governing authority, to infer current and future behavioural inclination, upon which appropriate preventative action can be taken (if needed) (Glambedakis & Watson, 2009).

**Passenger Screening**: When passengers proceed past check-in and are stopped by guards at a security screening point upon which passengers pass through metal detectors (Joint Committee of Public Accounts and Audit, 2004).

**Preventative profiling**: A pre-emptive measure to avert an action or situation from eventuating.

**Privacy**: The act of keeping information or data confidential by an individual (Glambedakis & Watson, 2009).
Privium: A Netherlands-based frequent traveller scheme which helps the passenger through border control checks and offers the passenger a wide range of services such as expedited check-in and reserved parking (European Commission Directorate-General Energy & Transport, 2007).

Proactive Approach: encouraging the prevention of failure before accidents and incidents occur.

Profiling (1): The process by which data is collected about an individual by an organisation and used by the organisation for the purposes of organisational gratification under the guise of ‘personalised service’ (Glambedakis & Watson, 2009).

Profiling (2): A means of building up a database of common characteristics that are displayed by people (Australian Customs Service, 2007b; Blau, 1994; Douglas, Ressler, Burgess & Hartman, 1986; Douglas & Olshaker, 1995; Petherick, 2003; Torres, Boccaccini & Miller, 2006; Wilson, Lincoln & Kocsis, 1997).

Prospect Theory: A decision-making theory first coined by Kahneman and Tversky (1979). Prospect Theory is based on ‘framing’ the problem once all information is known. The way in which a problem or situation is presented for solving (framed) has an immense bearing on the decision made by an individual (Mianelli, 2004, November).

Protection Motivation Theory: A decision making theory widely used in medicine which is based on the notion that behaviour is directly proportional to the motivation of the aggrieved person to protect themselves against further harm. In other words, people are more likely to protect themselves against harm if the consequences are high enough.

Qualitative Research: Qualitative research derives meanings of social phenomena such as attitudes, perceptions and behaviour as experienced by people in their natural environment (Coffey & Atkinson, 1996; Lincoln & Guba, 1985).

Quantitative Research: detailed action plan based on perceived objectivity to its subject, measured by statistical methods and numbers (Abusabha & Woelfel, 2003; Creswell, 1994).

Radio Frequency Identification: This is a form of wireless technology that employs radio waves to identify people and objects (Copenhagen Airports, 2008).

Rational Choice Theory: A classical criminology theory stating that offenders choose their crime after they have considered both personal and situational factors (Siegel, 2008).

Reactive Approach: instances where an organisation or industry will wait for an incident or accident to unfold, thus highlighting deficiencies within the safety network of that industry before they can be corrected; that is responding to an accident rather than foreseeing one (Pariés, 1996).
**Registered Traveler Program:** This scheme allows passengers to choose to undergo in-depth background investigations in exchange for shorter security checkpoint lines (Electronic Data Systems Corporation, 2007b).

**Research Practicability:** Refers to the economy, convenience and interpretability of the research (Thorndike & Hagen, 1969).

**Research Reliability:** refers to the ability of the research to be replicated, given the same environment and the same stimulus as well as the extent to which the research is free of error (Bryman, & Cramer, 1994; Cooper, & Schindler, 2003; Hunter, & Burke, 1994; Wiggins, & Stevens, 1999).

**Research Validity:** Validity in research refers to the way in which the data gained is an accurate measure of the variable under observation (Christensen, 1991; Goldstein, 1978, Wiggins & Stevens, 1999).

**Risk (1):** The possibility of loss, injury, disadvantage or destruction (either personal or commercial) from an exposure to a hazard or some form of danger or to incur the possibility of danger through any action or inaction (Glambedakis & Watson, 2009).

**Risk (2):** The subjective assessment of the possibility of injury or loss of life in relation to encountering a hazard (Hunter, 2002).

**Risk Analysis:** Used to estimate the chances of a specific set of events occurring and/or their potential consequences (Kunreuther, 2002, p. 656).

**Risk Management (1):** Conserving assets and minimising exposure to losses by detecting hazards before they lead to losses and taking the appropriate corrective action when these risks cannot be eliminated (International Civil Aviation Organization, 1984).

**Risk Management (2):** The process of indentifying and planning for the risks of any major new project and of ongoing operational activities (University of Oxford, 2003).

**Risk Perception:** The way in which an individual’s psychological and emotional state influences the decision making process in view of a potentially dangerous situation (Glambedakis & Watson, 2009).

**Routine Activity Theory:** A classical criminology theory stating that there must be three bases upon which crime can take place. These are a motivated offender; the absence of a guardian; and a suitable target (Cohen & Felson, 1979).

**Secure Flight:** An internal USA passenger profiling scheme that compares data about individuals known or suspected to be engaged in terrorist activities by assessing information from PNR data, along with commercial databases, or consolidated watch-lists (Government Accountability Office, 2005; Transportation Security Administration, 2004a).
**Situational Crime Prevention:** Situational crime prevention is a crime control strategy based on the Rational Choice Theory and focuses on the settings of the criminal act rather than those committing those acts (Clarke, 1997).

**SmartGate:** An Australian border control system that uses facial recognition technology to correlate a photo taken of the passenger at departure with that digitally stored in the passenger’s ePassport (Australian Customs Service, 2007a).

**Terrorism:** Acts of premeditated, politically motivated violence against innocent targets by sub-national or clandestine groups for the purpose of public recognition of a political or religious cause (Busch & Weissman, 2005).

**Terrorist Personality:** Individual characteristics which are common in people who enact terrorist violence against others.

**Theory of Reasoned Action:** A decision making theory that attempts to explain the relationship among beliefs, attitudes, intentions, and behaviour of individuals based on the assumption that people are rational and apply information available to them in a systematic manner to weigh the costs and benefits of a particular action (Ajzen, & Fishbein, 1980).

**Trust:** A set of attitudes and expectancies about other people and the organisational systems within which they are embedded (Jeffcott, Pidgeon, Weyman, & Walls, 2006).

**US-VISIT:** This is a USA-based passenger profiling programme which tracks the entry and exit of foreign visitors to the United States by using electronically scanned fingerprints and photographs (Creedy, 2007; U.S. State Department, 2004).
Appendices
Appendix A Information Sheet

Information Sheet

A survey about aviation security

My name is Antony Glambekakis and I am a PhD student in the School of Management at the University of Western Sydney conducting research on passenger perceptions of aviation security in Australia. Dr. Jim Mitchell, Associate Professor Don Robertson and Genevieve Watson at the University of Western Sydney are supervising me. Aviation security is an important issue amongst travellers and the aviation industry in general.

You have been contacted by either the PhD student or their representatives assisting in the research. This research is designed to gain passenger opinions on recent aviation security initiatives. Your opinions are important to this research and I would appreciate it if you would complete the attached survey. Completion of which should take you about fifteen (15) minutes. Once you have completed the survey, you can return email it to a.glambekakis@uws.edu.au. If this survey was handed to you, once you have completed it, you can fax it to the following number: (02) 4520 3115. No record of the sender’s email address will be retained. There are no known or anticipated risks to participating in this research.

Participation in the research is voluntary and information you provide will be considered confidential and anonymous. You can withdraw at any time. Participant anonymity is assured by the removal of any identifying information before it appears in the final report. Participants will be informed of the research outcome once the data has been analysed. Data that is collected shall be kept in secure storage at the University of Western Sydney for a period of five (5) years after the completion of the interview. After this time, the data will be destroyed.

We appreciate your participation in the research and if you have any questions, please do not hesitate to contact the PhD student Antony Glambekakis on 0412 812 057 or any of the supervisory panel including Dr. Jim Mitchell on (02) 4520-3316, Associate Professor Don Robertson on (02) 9772-8670, or Genevieve Watson on (02) 4520-3138.

Thanking you in advance,

Yours Sincerely,
Antony Glambekakis
PhD Student

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee reference: HREC 07/098. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 02 4736 0883 or 02 4736 0894). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix B Consent Form

Consent Form

A survey about aviation security

I have been asked to participate in the research on preventative measures in aviation security: A profiling approach. Conducted by Mr Antony Glomadoskis, PhD candidate, at the University of Western Sydney, College of Business, School of Management. This research has been approved by the University of Western Sydney Human Research Ethics Committee: reference: HREC 07/098. I give my free consent by filling out and returning the survey and/or signing this form and understand that:

1. The research will be carried out as described in the Information Sheet, a copy of which I have retained.
2. I have read and understood the Information Sheet and have had the opportunity to have all my questions answered to my satisfaction; and that
3. My participation is voluntary and I may withdraw from the research at any time by giving notification, but do not have to give a reason for my withdrawal.

Signature.................................................... Dated / / 2008

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee reference: HREC 07/098. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 02 4736 0603 or 02 4736 0694). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix C Survey Form

Survey Questions:
A survey about aviation security

Thank you again for participating in this research.

The return of this survey is an indication of your consent to be included in the research process.

If this survey is administered via e-mail, your instructions are to place an ‘x’ in the box. If it is handed to you, please tick the appropriate answer. If you require more space for your written answers, please write on the back of the page indicating which question you are answering.

Once you have completed the survey, you can either fax it to the following number: (02) 4620 3115 or return email it to a.damiasakis@uws.edu.au.

1. What is your current view on security (safety) in international air travel?

   1. Unsafe with or without security: [ ]
   2. Unsafe because security is generally poor: [ ]
   3. Safer because of better security: [ ]
   4. Extremely safe because of better security: [ ]
   5. Uncertain about security levels and effectiveness: [ ]

Why?
__________________________________________________________
__________________________________________________________
__________________________________________________________

2. Would you travel less frequently (nationally or internationally) if there are further security impositions that would result in more delays?

   1. Yes [ ]
   2. No [ ]

If Yes, how and why?
__________________________________________________________
__________________________________________________________
__________________________________________________________
3. What is your opinion on the increased level of security at airports?


4(a). What different approaches to security do you think authorities should do to safeguard passengers from threats?


4(b). How should this be accomplished?


5. Do you think that a form of ‘trusted traveller’ or ‘registered traveller’ scheme where passengers undergo a background check and are given an identity card in lieu of having to pass through security every time they travel should be introduced to safeguard passengers from threats?

1. Yes
2. No

Why?


6. Would you be willing to undergo increased security checks if it meant an increase in security for the flight and thus a greater chance of you arriving at your destination safely?

1. Yes
2. No

Why?


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7. Which of these destinations do you consider safe to travel to and why?
   a) Sydney
      1. Safe
      2. Unsafe
      Why?
      _______________________________________________________
   b) Tokyo
      1. Safe
      2. Unsafe
      Why?
      _______________________________________________________
   c) New York
      1. Safe
      2. Unsafe
      Why?
      _______________________________________________________
   d) London
      1. Safe
      2. Unsafe
      Why?
      _______________________________________________________
   e) Paris
      1. Safe
      2. Unsafe
      Why?
      _______________________________________________________
   f) Other Destination (Please write in your own choice):
      _______________________________________________________
      1. Safe
      2. Unsafe
      Why?
      _______________________________________________________
8. When did you last travel on an aeroplane?
   1. 0-6 months
   2. 6 months-1 year
   3. 1-3 years
   4. 4-8 years
   5. 7+ years

9. How frequently do you travel by air?
   1. 6 monthly
   2. yearly
   3. every 18 months
   4. 2-4 years
   5. 4+ years

10. What is the majority of your aeroplane travel related to?
    1. Business
    2. Leisure

11. What age bracket do you fit into?
    1. 18-25 years
    2. 26-33 years
    3. 34-41 years
    4. 42-49 years
    5. 50+ years

12. What is your gender?
    1. Male
    2. Female

13. Do you have any comments relating to these questions that you wish to add?

Thank you for your time and patience in filling out this survey and being part of this research process.
NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee reference, HREC 07/090. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 02 4736 0863 or 02 4736 0884). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix D Justification of Survey Questions

The Survey consists of thirteen questions. Each of the questions had either a Yes/No or ‘tick a box’ component along with a ‘why?’. Question 1 asked the respondent’s opinion on the current state of aviation security. Answers to Question 1 could be in one of five different boxes. Respondents could pick either: 1. Unsafe with or without security; 2. Unsafe because security is generally poor; 3. Safer because of better security; 4. Extremely safe because of better security; or 5. Uncertain about security levels and effectiveness. After picking any one of these options, respondents had the opportunity to justify their answer by filling in the ‘why?’ component of the question. This question was asked at the outset in order to gauge the knowledge base of the traveller on the topic of aviation security.

Question 2 asked whether or not travellers would consider travelling less frequently if there were greater delays at airports. This response was either a Yes or No along with a ‘why?’ Question 2 was designed as transparent as it can be. It simply asks what it states, if people would travel less frequently if there were more delays due to security concerns.

Question 3 asked respondent opinions on the increased level of security at airports. As with Questions 1, 2, Question 3 was designed to gauge traveller’s perceptions of airport security.
Question 4 was divided into two parts. Question 4 (a) asked if there were any different approaches that could be taken by authorities to safeguard passengers from threats. Question 4 (b) followed from that asking how the suggestions could be accomplished. The reasoning behind this question was to get the respondents perceived direct involvement in the possible best way to handle increased security at airports.

Question 5 asked for passenger opinions on the use of ‘trusted traveller’ or ‘registered traveller’ schemes. It specifically asked whether or not the use of these schemes, whereby passengers forgo the usual security checks every time they fly, by having a thorough security clearance check and being given an identity card, which is ‘tapped’ at a check-point every time they fly, was a positive move by authorities. This question was included due to the increased usage of registered traveller programmes that have been initiated by governments around the world as the preferred method of increased aviation security. An Australian perspective from the passenger point of view was needed if Australia chose the go down that pathway. The consequence of this is that if passengers are unwilling to be involved in such a programme, then it will not succeed and other measures may be needed.

Question 6 was a copy of Question 5, only asked slightly different. Question 6 asks if passengers would undergo greater security checks in order to ensure, as much as possible, a safe journey. The reasoning behind a slight re-word of Question 5 is to ascertain whether or not respondents realised that they were being asked the same thing and if they responded in a similar fashion.
Question 7 asks for respondent’s opinions on how safe they feel when travelling through/to certain airports. The question is divided up into six parts (a-f). The seven different airports are (a) Sydney, (b) Tokyo, (c) New York, (d) London, (e) Paris, and (f) Other destination. These airports were chosen as they each represent a geographical area (Oceania, Asia, North America, United Kingdom and Europe) as well as being major airport hubs that transit many passengers each day and are some of the main global airports. The reasoning behind having this question was to see whether or not there was a divergence of opinion on the safety felt at home (Sydney) to that of being at other destinations.

Questions 8, 9, 10, 11 and 12 are general information questions. Question 8 asks the respondents when their last travel was taken. This question can be answered by picking one of the five date-ranged boxes. These ranges are 0-6 months, 6 months-1 year, 1-3 years, 4-6 years, and 7+ years. This question was designed to discover how recent the respondent had travelled.

Question 9 asked the respondents how frequently they travel. Respondents can answer the question by ticking one of the date-ranged boxes. These date ranges are 6 monthly, yearly, every 18 months, 2-4 years, 4+ years. This was included, as those who have not travelled recently (within the 2-4 year bracket or less) may not have experienced the rapid changes in aviation security that have occurred, such as the restriction on liquids in the cabin and in cabin baggage.

Question 10 asks what the majority of the respondent’s aeroplane travel is related. This can be either business or leisure. Answers to this question can then divide up the
respondents into those who usually travel for either business or leisure and see if there are any differences of opinion on the level of security at airports.

Question 11 asks the respondents to pick their age bracket. The ages range from 10-28, 26-33, 34-41, 42-49, and 50+. While Question 12 asked for the respondent’s gender and Question 13 asks for any comments that the respondents may wish to make regarding the survey.