

The association between emotional intelligence and decision making for pilots

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Abstract

Emotional Intelligence (EI) refers to the regulation, perception, and management of self and others' emotions. EI has been used to gain insight into decision making in corporate Human Resource Management (HRM) contexts, as well as in stressful situations. The potential link between EI and decision making in HRM could have great benefit to training and management in high-consequence and safety-critical industries. This research investigated the association between EI and decision making of pilots in the aviation industry. The aim was to uncover the level of association between EI dimensions and decision making for pilots; as well as to understand the role that pilots perceive EI dimensions play in their decision making in safety-critical scenarios. One hundred and seventeen pilots completed an online survey comprised of the Wong-Law EI Scale, decision making scenarios, and open-ended questions. The mixed-method analysis of the survey data showed a correlation between individual EI dimensions and decision-making scenarios, rather than the total scores. There are potential implications for general HRM research in EI and decision making as well as practical implications for the aviation industry. Overall, it was found that there is a link between EI and decision making, specifically for scenarios that involve other cognitive functions.

Keywords: Aviation Safety; Crew Resource Management; CRM, Decision Making; Emotional Intelligence; Flight Crew; Human Factors; Human Resource Management; HRM;

1. Introduction

1.1. Background

In 1903, the Wright Brothers were the first to achieve powered, sustained, controlled heavier-than-air machine flight with a pilot aboard. However, in 1908 they also experienced the 'first airplane passenger death' (Paur 2010). While, this accident was the result of a technical issue, contemporary accidents primarily arise from Human Factors (HF) (Rankin 2009). It can be argued that Emotional Intelligence (EI) is an important aspect of HF and has been used to understand recruitment and task assignment for both productivity and safety concerns in many industries (Sayegh, Anthony et al. 2004). While there are several distinct ways to define EI (Kim and Kim 2017), four dimensions are commonly utilised, such as 1) self-emotional appraisal (SEA), 2) other's emotional appraisal (OEA), 3) use of emotions (UoE), and 4) regulation of emotion (RoE). An analysis of the literature suggests that EI, specifically regulation of emotion, may play an important role in decision making (Buckley, Wheeler et al. 2017). Furthermore, other scholars have suggested that EI contributes to decision making in high-consequence industries (Dilawar, Durrani et al. 2021). There are distinctive technical, social, and psychological capabilities that pilots need to utilise both before, during, and after a flight (Harris 2012); all these have potential implications for decision making, especially in safety-critical situations.

1.2. Significance

Decision making in aviation is critical to safety; even though pilots are well trained, errors still occur given the nature of operations and the pressures of situations (Laouar, Rauffet et al. 2018). In a study of human factors accidents, Kharoufah, Murray et al. (2018) showed that along with situational awareness, accidents involving non-adherence to procedures occurred more frequently than expected. In these 'non-adherence to procedure' events, pilots decide to contravene standard operating procedures, resulting in accidents. The cost associated with aviation accidents in Australia was estimated at \$3.1 million per fatality (Wild, Pollock et al. 2021). If we look at a severe example of non-adherence to procedures, such as Gulf Air flight GF072 on the 23rd of August 2000, there were a total of 143 fatalities,

which would have an approximate total cost of \$443 million. As such, research to better understand pilot decision making has a direct impact on aviation safety, as well as significant economic benefits.

1.3. Aim

This research aims to provide an understanding of the association between EI and decision making in Australian-based pilots. A survey was distributed to pilots through LinkedIn to obtain both quantitative and qualitative data. The survey measured the level of EI in the respondents across four dimensions with the Wong and Law Emotional Intelligence Scale (Wong and Law 2002, Law, Wong et al. 2004), which is detailed in the methodology section. Furthermore, the survey quantified the respondents' risk appetite in hypothetical scenarios that could potentially lead to an accident or incident; these scenarios were created by aviation academics based on previous accident and incident cases. Finally, open ended questions assessed the respondents' perceptions of the EI dimensions, and how they perceive the influence these dimensions had on the decisions they made. The quantitative data measured any direct association between EI and decision making. To provide a deeper understanding into this topic, two research questions were proposed:

- 1) What associations, if any, exist between Emotional Intelligence and decision making in pilots, and how significant are these associations?
- 2) What role do pilots perceive Emotional Intelligence dimensions play in their decision making in simulated safety-critical scenarios?

It was initially hypothesised that pilots who have a higher measured level of EI will make safer decisions in safety-critical situations, as Emotional Regulation and appraisal of self and others' emotions would potentially aid in remaining calm and maintaining situational awareness.

2. Literature Review

2.1. A brief history on Emotional Intelligence Theory

Often credited as first distinguishing between EI and other forms of intelligence, Thorndike (1920) originally stated that Social Intelligence is 'the ability to understand and manage men and women, boys and girls – to act wisely in human relations'. Since the original distinction of EI from other forms of intelligence the term Emotional Intelligence appeared in psychological books such as Davitz and Beldoch's (1964) on communication and emotion, and Gardner's (1983) on the implications of how traditional understanding of Intelligence Quotient (IQ) may disregard other forms of cognitive ability, such as Emotional or Social Intelligence. Payne's (1985) dissertation is the first large scale study solely on the topic of EI and is regarded as a seminal work by other authors such as Chauhan & Chauhan (2007). However, Mayer and Salovey (1990) initiated the call for a structured model of EI, defining it as the 'ability to monitor one's own and others' feelings and emotions, to discriminate among them and use this information to guide one's thinking and actions'. As the concept of EI gained traction, Goleman (1996) restated the importance of EI in the discipline of psychology, but also additionally for management and leadership studies, indicating that EI is where motivation, drive, and the key to successful leadership lies. However, Pfeiffer (2001) acknowledges the popularity of EI, particularly the accounts by Mayer and Salovey (1990) and Goleman (1996), that cautioned against the use of any quantitative model of EI before it had scientific credibility. Since then, numerous scales have been formulated to try and quantify EI, with varying degrees of validation (Bar-On and Parker 2000, Boyatzis, Goleman et al. 2000, Law, Wong et al. 2004, Mayer and Salovey 2007). These scales of EI measurement will be discussed and analysed in the methods section of this paper. Within the discipline of psychology, EI has since been folded within the subdiscipline of psychological studies called Positive Psychology, which is the study of positive aspects of the human experience, considering the experiences of individuals and society as a whole (Salovey, Mayer et al. 2009, Bar-On 2010, Seligman and Csikszentmihalyi 2014). Finally, as suggested by Goleman (1996) and referenced in his later works (Goleman 1996, Cherniss and Goleman 2001, Goleman, Boyatzis et al. 2002, Goleman, Boyatzis et al. 2013, Goleman and Boyatzis 2017), EI testing and targeted human resource training for EI can improve organisational culture, enhance leadership performance, and even potentially increase wellbeing in the workplace (Yadav 2014).

2.2. Human Resource Management (HRM) and Emotional Intelligence

The potential implications of EI research for organisational culture and wellbeing have generated considerable interest in this research topic in HRM studies. The literature, in general, indicated benefits that individuals with a higher level of EI are said to display in the workplace. Similarly, it could be suggested that the interest in EI for HRM comes from the predicted benefits it holds, such as social cohesion in the workplace, productivity, lower turn-over rates, and better conflict resolution among staff. The importance of EI as a research topic in HRM stems from the perceived overall organisation-wide benefits, in that, the EI of one person may produce benefits for more than a singular individual, as suggested by literature on Positive Psychology (Seligman and Csikszentmihalyi 2014). However, in accounting for the literature in Section 2.3 that relates to higher-EI individuals being more equipped to handle stressful situations, or moments of inter-personal conflict, it may also be suggested that EI holds importance for HRM in specific industries that involve the successful navigation of stressful situations.

Further research in HRM detailed multiple observed benefits of individuals having higher EI in the workplace. High EI individuals are observed to have constructive conflict resolution techniques and to be collaborative solution seekers (Jordan and Troth 2002, Başoğlu and Özgür 2016, Krishnakumar, Perera et al. 2019). High EI individuals are observed to have a higher chance of job satisfaction and overall wellbeing, which then affects turn-over and retention rates in the organisation (Ioannis and Ioannis 2002, Brunetto, Teo et al. 2012). High EI individuals, or those who undergo EI training, have been observed to experience less stress under pressure as suggested in the human resource literature and medical literature (Ioannis and Ioannis 2002, Slaski and Cartwright 2003, Landa, López-Zafra et al. 2008, Singh and Sharma 2012). Workplaces with a large number of high EI staff have observed better levels of productivity and profits (Ioannis and Ioannis 2002, Brunetto, Teo et al. 2012). The social implications of having high EI inadvertently benefit the organisation as employees can navigate the social systems of an organisation, between colleagues or hierarchical relationships (Buckley, Wheeler et al. 2017, Vasudevan, Mahadi et al. 2017, Lakshmi and Rao 2018, Wolcott 2018, Krishnakumar, Perera et al. 2019).

2.3. Links between EI and decision-making

The emotional states of individuals in general, have been shown to impact on their decision making, attention, and memory (LeBlanc, McConnell et al. 2015). Therefore, it could be suggested that as emotional states can play a critical role in decision making, that the ability to regulate emotion, associated with EI, may be of great use to individuals in order to regulate the impact emotions may have on their decisions. In HRM, EI has also been shown to impact decision making in several ways. For example, EI moderates career decision making and self-efficacy (Jiang 2016), career decisiveness (Di Fabio, Palazzeschi et al. 2012, Farnia, Nafukho et al. 2018), and deciding whether to engage in an emotionally difficult situation when only provided with non-verbal cues (Alkozei, Schwab et al. 2016). Furthermore, in stressful situations, it has been shown that higher levels of EI improve tactical decision making in the aid of safety and time-sensitivity (Fallon, Panganiban et al. 2014). Fallon et al. (2014) concluded that information searching was an important factor of decision making, and that both EI and cognitive ability independently predicted higher search activity, potentially highlighting the importance of social attention and awareness in EI.

There are established links between EI and decision making in the literature. George (2000) critically analysed the link between EI and leadership where it was argued that the four major dimensions of EI and the 'five essential elements of leadership effectiveness' are related at a theoretical level, resulting in a practical link. Specifically, knowledge of emotions and experiencing emotions may have positive implications for decision making. Similarly, Sayegh, Anthony et al. (2004) detail a conceptual model for managerial decision making when in a crisis, which consists of underlying factors that impact decision making including explicit knowledge, cognitive schema, efficacy, and emotional memory. They indicated reflection and learning from mistakes combined with emotional memory may result in timely and intuitive crisis-response decision making.

Furthermore, Chauhan & Chauhan (2007) state that managers with a higher EI score will have a linked higher score in their decision making and self-efficacy. They found that a higher-level manager correlated with a higher EI and higher decision-making accuracy. As discussed by Sumathy, Madhavi & Felix (2015), the higher the level of management, the more impact decisions have. Therefore, it could be argued that top-level managers are making arguably more high-consequence decisions as their decisions may impact more employees. In this case, of more consequence allotted to the decisions, top-level managers are expected to have a good grasp of decision-making strategies and forethought into repercussions. The authors further work also found that when people make decisions, they are more likely to think about the emotions the outcomes are likely to trigger, highlighting the importance of self

and others emotional appraisal and emotional regulation in decision making (Sumathy, Madhavi et al. 2015). As this research focused on executive leaders, it could also be stated that the decisions being made by these leaders are consequently going to have more of an impact on others, and therefore could be a higher-consequence decision than those made by employees or managers. EI is shown to influence decision making in executive decision-making and outlines the importance of EI in a strategic decision-making process.

Seo and Barrett (2007) found that people with 'strong emotions' or who experience intense empathy towards situations may be better decision-makers provided they are aware of their affect (in the psychological sense), are able to regulate it, and instil an element of rationale into the situation. This is supported by Rausch, Hess & Bacigalupo (2011), who found that EI has the potential to enhance the quality of decision making. Emotionally intelligent people are more likely to be self-aware. Therefore, they can assess their own and others' strengths and weaknesses to best leverage a team in a decision-making situation. Alkozei, Schwab, & Killgore (2016) analyses the role of EI in making emotionally difficult decisions. The authors highlight the importance of ability-based models of EI in making correct decisions in high-pressure environments as it was posed that the ability to regulate emotion to engage other cognitive systems aids decision making. These links between EI and decision-making also apply in a group setting. Zhou, Zhu & Vredenburg (2020) studied the prevalence of individual EI on group decision making with psychological safety as a mediator. They found that team EI (aggregate individual EI) is important in decision-making but is moderated by psychological safety and team norms and culture. Higher EI individuals have a higher influence on team decision making (in the type of information they choose to reveal or withhold and with conforming or deviating from group standards).

The link between EI and decision making has been investigated in several other aspects of HRM. Brown, George-Curran & Smith (2003), investigating career decision making, found that EI measured by empathy, utilisation of feelings, handling of relationships and self-control (the four factors of the scale used) is positively related to career decision making self-efficacy. This finding aligns with Goleman's (1996, 2017) argument that EI is a positive factor for career commitment and success. Scott-Ladd & Chan (2004) suggest that effective organisational learning requires emotionally intelligent employees who participate in decision-making to encourage a culture of continuous improvement with quality responses to change. Emotionally intelligent employees are likely to want better outcomes for themselves and others, so they will make objectively better decisions that benefit the organisation. Therefore, these emotionally intelligent employees should be participating in decision making to insight organisational learning and change. Finally, Kidwell, Hardesty & Childers (2007) claim that consumer behaviour is inherently linked to decision making (choosing between a variety of products, trade-offs etc).

Specific to high-consequence industries, Dilawar et al (2021) found that in professionals who regularly encounter emergencies, such as first responders, EI significantly moderated the relationship between stress, rational, and intuitive decision making. Therefore, EI could be considered a relevant concept to consider as a moderator for logical decision-making in corporate environments and a wider range of industries where stress is a prominent consideration in decision-making activities. Furthermore, the links between EI and general stress management and EI and general decision-making support the conjecture that EI may be an important moderator for decision-making in industries with a high level of stress. This review is an indicative insight into key literature on the topic of EI and decision making. However, as shown, there is a potential gap for a link to be yet established in aviation for EI and decision making, a commonly high-stress environment for one of the key personnel aboard the aircraft: the pilot.

2.4. Emotional Intelligence and Decision Making in the Aviation Industry

This section provides further insight into the unique decision-making features of cabin and cockpit crew aboard commercial aircrafts and the potential importance of EI. The rationale for focusing attention on commercial aircraft crew in this proposal is that the majority of 'human factors' (HF) literature is embedded in commercial air travel, due to the emphasis on safety in commercial aviation as a result of the severity of fatalities in human error accidents (FAA 2018). HFs are an integral part of the aviation industry, and refer to many non-technical skills, ergonomics/human machine interface, and Crew Resource Management (CRM) training that is implemented to reduce human error in aviation incidents and accidents (Adams 2006). As such, HF relates to EI and decision making, given that poor decision making has the potential to increase human error accidents and incidents. EI is related to the HF of aviation in turn, as EI may aid decision making, and thus, potentially reduce human error. Specifically for cockpit crew, decision making can be a cognitively taxing and high-consequence activity that relies on multiple sources of information in a time sensitive environment that requires a high level of accuracy (Laouar, Rauffet et al. 2018). Causse et al. (2013) determined that, in pilots, the decision to follow through with a plan even when it is no longer safe to do

so, can be triggered by a ‘temporary impairment of rational decision making due to negative emotional consequences attached’ to the revised plan. Therefore, it could be suggested that emotional regulation, associated with EI, would potentially aid such a situation.

Tasks being carried out or monitored by humans can be clouded by emotion or social behavioural factors especially in a high-risk industry such as aviation - where decision-making and emotional regulation are significant topics. Gupta and Kumar (2015) stress that awareness and self-management of emotion is crucial to pilots, as many incidents and accidents are due to human errors that are driven by pilots who have ‘grossly neglected the professionalism and [are] purely driven by uncontrolled emotions’. Similarly, a study by Hokeness (2012) suggests that flight students’ successful advancement through their training is associated with flight instructors’ EI (Hokeness 2012). As such, EI has already been raised as a concern in aviation, especially in the context of safe operations. Therefore, considering the literature on decision making and EI, the accidents and incidents accrued by uncontrolled emotions may potentially also provide additional insights on the nature of EI and decision making in aviation. Additionally, EI has been assessed as a concept that could be helpful in the HF of aviation for CRM, cockpit crew coping with stress and regulating thoughts, as well as an overall insight into the interrelated nature of technology, teamwork, and emotional appraisal and regulation (Matthews, Emo et al. 2003).

In the USA, for example, the sterile cockpit rule states that at or below 10,000 feet (critical flight phase) all non-essential activities, or not directly related to the safe operation of the aircraft in the cockpit, are forbidden (FAA 2014). The sterile cockpit rule, initiated by the National Transport Safety Board as a direct result of a HF accident that caused 72 fatalities (NTSB 1975), has caused implications for emotional regulation and decision making for cockpit and cabin crew since the inception of the rule (Wiener, Kanki et al. 1995). However, the addition to cabin crew and cockpit crew joint CRM aims to address this, certain EI and decision-making implications maintain prevalence.

3. Methodology

3.1. Research Design

To explore the associations between EI and decision making of pilots in safety critical situations a convergent explanatory research design was utilised. In this approach, a conventional explanatory design was modified (Leedy and Ormrod 2015), whereby both quantitative and qualitative data were collected simultaneously with the qualitative data being used for multiple purposes (Wisdom and Creswell 2013). In the explanatory component, a predominately quantitative analysis was performed, followed by the qualitative analysis to provide further insight into the quantitative findings, using the open-ended questions on the survey (Bryman 2006). The convergent aspect was utilised when the open-ended questions were responded to in much greater detail than initially anticipated. This yielded a greater amount of rich qualitative data which could be utilised alone in the convergent component. This allowed for a more in-depth explanation of the quantitative data, and to provide a more comprehensive account of the data by employing both methods. That is, a convergent explanatory research design aims to provide more points of interest to better represent the data collected (Creswell and Plano Clark 2011).

Figure 1 illustrates the convergent explanatory research design, inspired by, and adapted from, diagrams in Creswell and Plano Clark (2011). As shown in Figure 1, the explanatory element is in the ‘data-validation variant’ of convergent design, in which open-ended questions have complemented closed-ended questions in the online survey. This specific portion of the research design has been both described as ‘explanatory design’ (Wisdom and Creswell 2013) and a form of ‘convergent design’ (Creswell and Plano Clark 2011). As such, the research design may be described as the mixed methodology design ‘convergent explanatory design’, or ‘convergent data validation variant design’.

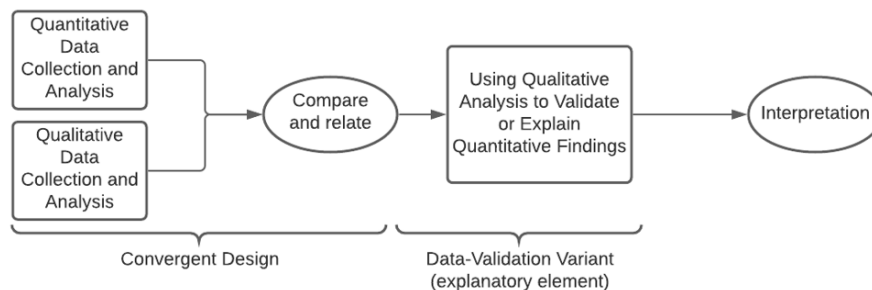


Fig. 1. Research Design Framework.

Creswell & Plano Clark (2011) indicate that a convergent design is suitable for research where there is limited time and there is equal value in both data sets. By using this method, a researcher can be better positioned to gain a greater appreciation of the associations the variables of interest as analysing both quantitative and qualitative data may present more in-depth or valid results due to the potential for triangulation of data (Morse 1991, Fielding 2012). The method chosen is appropriate because mixed data is required to understand what associations are present, how the variables are associated, and potentially why participants answered scenarios a certain way (Clark and Badiee 2010). The quantitative data collected (EI and decision-making section of the survey) will address the first research question. The second research question will be answered by the qualitative data collected, and this provide a deeper understanding of the topic. Further, the qualitative data was drawn on to validate or further explain the quantitative findings, supporting both research questions. The role of the qualitative and quantitative data and separate analyses in this research design is 'to obtain different but complementary data on the same topic' (Morse 1991).

3.2. Quantitative Methodology

The quantitative methodology is a descriptive survey. This is part of the broader category of descriptive research (Leedy and Ormrod 2015). A descriptive survey has been selected, as the aim is to attempt to understand the population, pilots, and the link between EI and decision making, by surveying a sample from that population. The principle of the methodology is simple: respondents are asked a series of questions with quantifiable responses, and inferences are drawn about the population. The survey instrument was shared online via social media (LinkedIn) to capture a broader base of pilots. The sampling is non-probabilistic, as there is not exhaustive population list available. However, there is also no reason to assume this sample may not be representative of a random sample taken elsewhere. While it is acknowledged that the entire sample is not a random sample, the way in which the non-probabilistic sampling was conducted differs to regular forms of non-probabilistic sampling, in that there were no quotas for participant levels, or desired demographic ratios (Mercer, Kreuter et al. 2017). By accepting all responses submitted there is no reason to not assume that while due to time constraints the survey sample was that of convenience, it is not like what may be produced in a random sample.

3.2.1. Emotional Intelligence Measurement

The survey instrument distributed to participants consisted of demographic questions, the WLEIS (Wong and Law 2002, Law, Wong et al. 2004), a decision making scenario section, and open-ended questions. Open-ended questions were developed for each decision-making scenario to mine further data concerning how pilots weighed various factors in arriving at their decisions for each scenario, and to provide insight into the valence of the various dimensions of EI. Further, the WLEIS tool has been chosen for this study as the academic credibility of the tool has been validated (Law, Wong et al. 2004), and for the potential sample size of the study, the WLEIS has been used in previous literature for those of similar sample size (Kassim, Bambale et al. 2016, Sun, Chen et al. 2017, Mérida-López, Bakker et al. 2019). The decision making scenario section of the tool has been informed by aviation academics and retired professionals, and is similar to scenario simulation questions found in Behrend (2017) which assesses the decision making capabilities of pilots through several questions asking the participant how likely they are to engage in an activity that go against safety regulation. The survey tool had a pilot study prior to the main study that garnered feedback from several aviation academics from different institutes in Australia to verify the phrasing of the decision-making scenarios. The WLEIS section of the survey adopted a Likert scale of 1 (strongly disagree) to 7 (strongly agree), as seen in the original test literature (Wong and Law 2002, Law, Wong et al. 2004).

3.2.2. Decision-Making Measurement

The decision-making scenario section of the survey used a 1 to 99 scale indicating level of agreement with the scenario. This score represents a percentage agreement with the scenario presented. A percentage was deemed essential, as it was initially expected that most pilots would be unlikely to engage in the proposed risky behaviours. As such, a fine scale from 90 to 99 was essential to resolve differences between those who were risk adverse (score of 99), and this with a greater risk appetite (score of 90), given scores between 0 and 90 were not anticipated. A single Decision-Making Index (DMI) for each respondent was then calculated by averaging the responses for all the scenarios. The six scenarios as included in the questionnaire were:

- 1) You are flying solo for a short nav; for the last few days the weather has been clear, and it is currently clear at the airport prior to your flight. How likely are you to do a thorough and complete review of the weather? (1= weather review not needed this time; 99 = always check the weather, no matter what).

- 2) You are flying with friends away for the weekend. They have excessive baggage when they arrive (including slabs of beer and cartons of wine etc), such that it exceeds limits. You know the performance of the aircraft very well. How likely are you to do a thorough and complete review of the weight and balance and unload items? (1 = not needed, I am pretty confident I know my aircraft; 99 = always review the weight and balance, no matter what).
- 3) You are operating an angel flight (a little girl needs a medical scan in the city this afternoon). After getting airborne on an VFR plan and proceeding in VMC without incident you note that there is a chance that of IMC at the aerodrome. How likely are you to turn around and head back to your departure aerodrome? (1 = proceed, it is only a chance, and it is an urgent flight; 99 = never risk flying into IMC in an aircraft not equipped to do so).
- 4) You are flying solo on a training flight, and you land harder than you have ever landed before, and it was your error (no weather or mechanical reason). How likely are you to report the hard landing to your organisation? (1 = not needed; 99 = always report a hard landing, no matter what).
- 5) You are out late having a good time with some colleagues. In the morning you are very fatigued from the night's activities, but you need to go into work as you left your phone/wallet there yesterday. When there, you note that the board shows your good friend, who was also out partying and drinking a lot last night, is currently scheduled for departure. How likely are you to report them as being in an unfit state to be flying? (1 = not needed, they know their capabilities; 99 = always report potential fatigue and drug/alcohol impairment, no matter what).
- 6) You are flying a small number of passengers on a charter flight. One passenger has informed the organisation they will be an hour late, and you have been told to wait for them. The temperature is hot, and it is getting warmer, and soon you will not have the performance required for take-off with the required fuel load to your destination. How likely are you to depart while it is safe to do so, and/or take other preventative measures (unload fuel and baggage)? (1 = not needed, the boss says wait and unload nothing, so I do as I am told; 99 = as the pilot, I am responsible for a safe operation, depart and/or unload, no matter what).

3.3. *Qualitative Methodology*

The purpose of the qualitative element of the study was to 'understand people's perceptions and perspectives of a particular experience' (Leedy and Ormrod 2015). In this case, the phenomena are EI and decision making, and the people are pilots. The data for this aspect of the research were collected via open ended questions included as part of the survey as purposeful sampling of groups of individuals can highlight meaningful concepts in the participant experience (Leedy and Ormrod 2015). Leedy and Ormrod (2015) also state that in overall convergent or explanatory research designs the purpose of the qualitative data analysis and overall qualitative methodology is to form other conclusions about the phenomena being studied quantitatively, or to provide support or greater substance to the quantitative analysis.

3.4. *Data Analysis*

As this research analysed both quantitative and qualitative data, different techniques were used for each respective analysis. Figure 2 presents a flow chart detailing how the two respective data sets were analysed simultaneously and combined for interpretation. Figure 2's top-down structure depicts the passing of time, noting that if there is a longer arrow on one data set side, but the other side has activities listed (for instance, the break in quantitative analysis while creating the qualitative code diagram), this is intended to show the timing of analyses. Figure 2 also features decision loops that identify the number of iterations of an activity, for instance in the qualitative section 117 respondents in 6 individual questions needed to be coded, and in the quantitative section 7 correlations were tested and 40 regressions models were created and tested.

3.4.1. *Quantitative Data Analysis*

A correlational and descriptive quantitative design was employed throughout the data analysis section of the research, in order to further interpret the main data pool (Bloomfield and Fisher 2019). The method for analysing the data was hypotheses testing using linear regression and multiple regressions. The quantitative data were analysed using STATA/IC 15.1 and Microsoft Excel. For the data analysis, two hypotheses have been made following the findings from the research hypotheses located in the introduction section, the statistical hypotheses are listed below.

The first statistical test will measure the association, specifically Pearson's Correlation Coefficient, between the total EI score and the average DMI score. The hypotheses are given as:

$$H_{0,1}: \rho_{DMI,EI} = 0$$

$$H_{A,1}: \rho_{DMI,EI} > 0$$

That is, the null hypothesis states there is no correlation between DMI and EI, and the alternative hypothesis is that there is a positive correlation between DMI and EI. The second statistical test will determine if the different EI dimensions have different effects on the DMI. The hypotheses are given as:

$$H_{0,2}: \beta_{DMI,EI1} = \beta_{DMI,EI2} = \beta_{DMI,EI3} = \beta_{DMI,EI4}$$

$$H_{A,2}: \beta_{DMI,EI,n} \neq \beta_{DMI,EI,m}$$

The null hypothesis states that the effect of each EI dimension on the DMI are the same gradient, while the alternative hypothesis states that any two of the dimensions (n or m) are not equal.

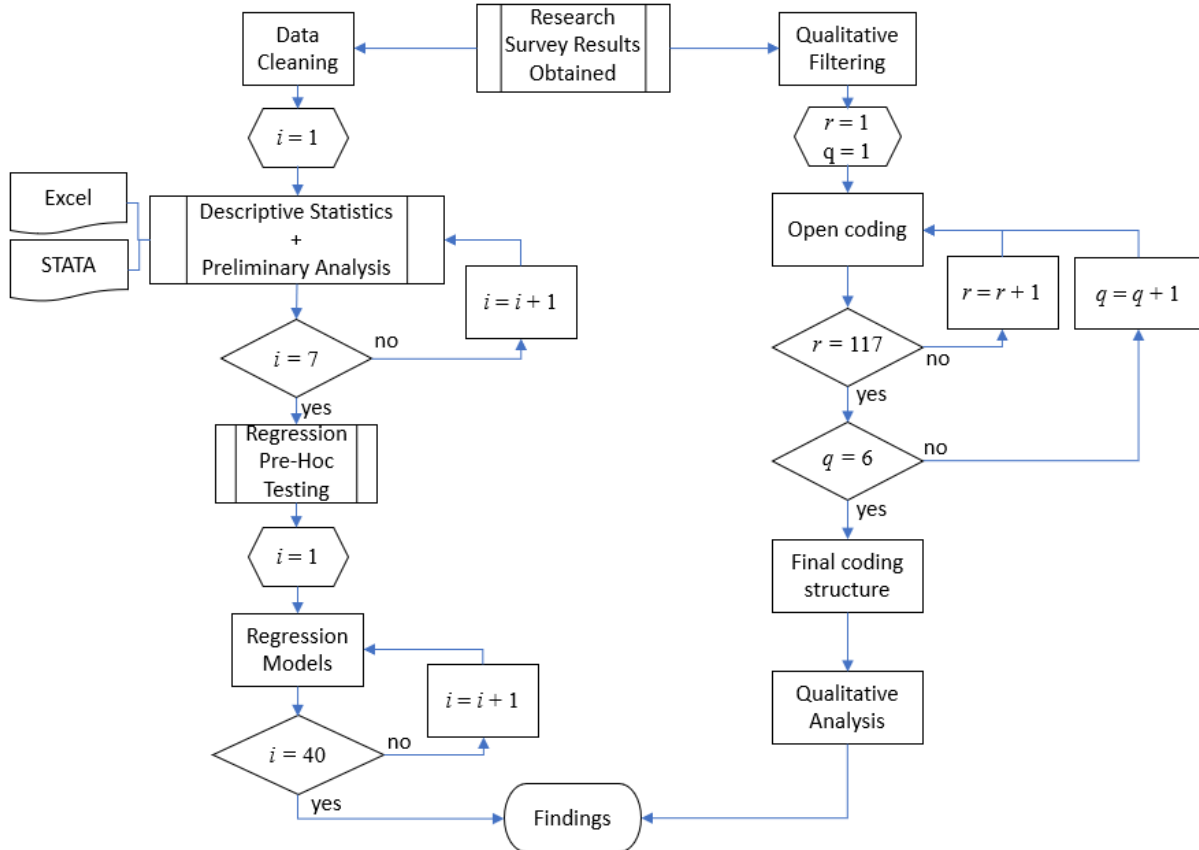


Fig. 2. Flow chart of data analysis process.

3.4.2. Qualitative Data Analysis

The open-ended survey responses formed the entirety of the qualitative data, with consideration that online surveys are an often underutilised, yet rich, source of qualitative data (Braun, Clarke et al. 2020). Survey data was downloaded from Qualtrics XM to Microsoft Excel, where the respondent reference number and qualitative data was exported to Microsoft Word. Here “manual coding” in basic word processor was utilised given the nature of the research scope (Saldaña 2009), and due to the time constraints of the project (Basit 2003). Initial open coding was completed, followed by abduction coding. This process attempted to remove any theoretical influences while honouring the data (Vogt, Gardner et al. 2014, Mitchell and Education 2018). After this, codes that were similar were collapsed and refined to correct for any differently phrased codes with the same meaning, or misspelled codes. Codes were then viewed separately from the response data in order of prevalence to create a series of ‘code tree’ diagrams which included codes grouped into categories of likeness based on meaning. For example, ‘currency’ and ‘personal values’ would come under the thematic category of ‘sense of self’. The thematic categories that resulted from the creation of the code trees allowed for inferences about the prevalence of codes in the data, and therefore a representation of the cohort’s feelings and opinions on the scenarios. After this, the explanatory, or data variant, element of the qualitative analysis was performed in Microsoft Excel by segregating certain demographics to view which codes were prevalent

for which scenarios. This part of the analysis involved reviewing the codes and response data to select quotes as examples that represented subsets of respondents, these examples were chosen based on the quantitative findings, the respondent data, and whether the quote represented other quotes in the same category. To facilitate a visual qualitative comparison between the codes (as opposed to quantitatively analysing the distribution of codes) excels inbuilt functionality. Here, 'Conditional Formatting' is used for a table, with 'Colour Scales'. Given the different groups would have different total counts, each column was conditionally formatted using the same relative green to red scale. This scale results in the code with the lowest count being the greenest (coldest), while the code with the highest could be the reddest (hottest). A total of seven shades were used between these two extremes. Between the columns codes can readily be identified as being similar or different based on if the colour is similar or different. Sample comments can then be extracted to either compare the similarities between groups or to contrast the differences.

4. Results and Analysis

The overall data analysis, both quantitative and qualitative focuses on the survey results of current aircraft pilots. The data in the following section includes the analysis of 117 online survey responses from trainee and other pilots recruited through LinkedIn.

4.1.1. EI and Decision-Making Scores

The average total WLIES (Wong-Law Emotional Intelligence Scale) score for the sample was 90.83, with a standard deviation of 9.35. Figure 3 shows the boxplots for the 16 individual WLIES measures (a), as well as the 4 combined dimensions of the WLIES (b). Figure 3 also shows the boxplots for the 6 decision-making scenarios (c), while the overall average decision-making score was 79.77 with a standard deviation of 13.1. As a result of the nature of the decision-making scenarios being highly personal, with a wide variety of choice (1-99), it is expected that the mean and SD are varied. Currently there is no overall validated standard for WLEIS scores for the general population or separate demographics. However, Table 1 gives a brief comparison of the WLEIS scores relative to other professional western accounts of average. To ensure similarity, the results in Table 1 correspond to 1) the cohort in Middleton, Kouta & Raftopolous (2016) that do not identify as having Postpartum Depression, 2) the mean of both genders from Acost-Prado & Zárate-Torres (2019), and 3) the individual question average in context of the overall dimensions from Jiao et al. (2020). As can be seen in Table 1 the current cohort's scores are comparable to those from other research with a demographic of individuals in western societies who are currently working professionals.

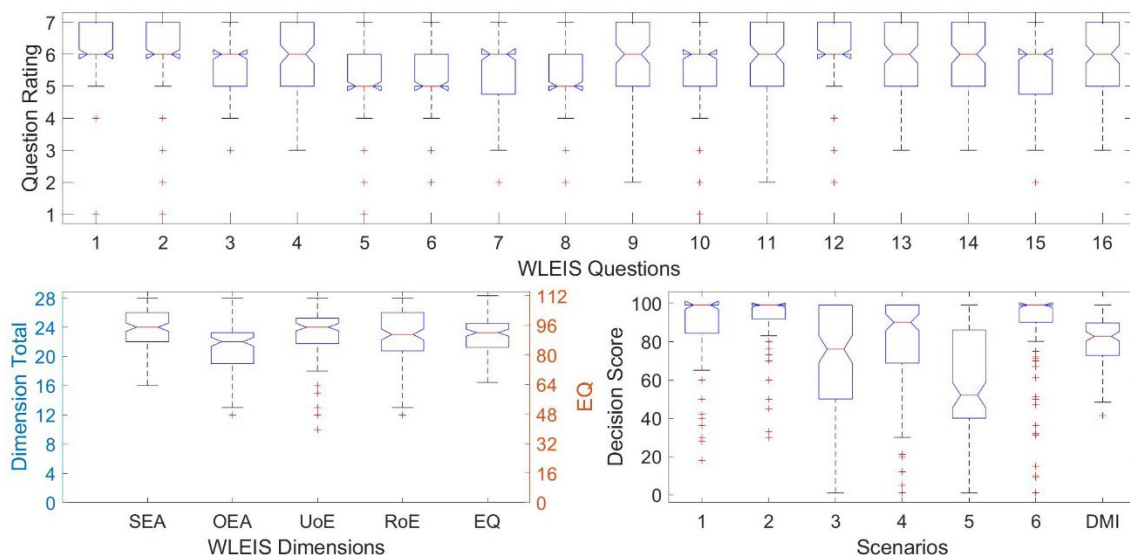


Fig. 3. Tiled chart containing notched boxplots of the quantitative data. Top, the 16 individual WLEIS questions. Bottom left the 4 WLEIS dimensions and total EQ. Bottom right, the 6 decision-making scenarios, and their average (the DMI).

Table 1. Comparison of WLEIS in other literature

Sample	WLEIS Dimensions			
	SEA	OEA	UoE	RoE
This Study	23.80 ± 2.87	21.10 ± 3.56	23.08 ± 3.47	22.85 ± 3.84
Midletton, Kouta & Raftopolous (2016)	24.11 ± 3.89	23.22 ± 3.87	23.31 ± 4.06	22.64 ± 4.38
Acosta-Prado & Zárate-Torres (2019)	23.38 ± 2.87	22.84 ± 2.87	24.47 ± 2.41	22.50 ± 3.12
Jiao et al. (2020)	22.56 ± 3.92	19.56 ± 4.28	20.64 ± 4.52	22.32 ± 3.80

4.2. Preliminary Statistical Analysis

The results for the 35 t-tests for correlation are given in Table 2, which summarises the analysis into the first and second statistical hypothesis. While for the first hypothesis the result is not statistically significant when comparing total EI to total DMI ($p = 0.15$), for the second hypothesis the results show some statistical significances between some dimensions of EI and specific decision-making scenarios. Where the individual results are statistically significant, the values are marked with an asterisk.

From Table 2 we can discern that decision 6 and SEA have a statistically significant positive correlation, additionally decision 1 and SEA, OEA and Total EI have a statistically significant positive correlation, all at $\alpha < 0.05$. All other DMI score and EI scores have no correlation. To analyse this further, linear regression will be used to visualise how EI and DMI correlate.

Table 2. Summary of Correlation (p-values)

	SEA	OEA	UoE	RoE	Total EI
Decision 1	0.05*	0.01*	0.97	0.97	0.02*
Decision 2	0.87	0.30	0.24	0.20	0.60
Decision 3	0.83	0.35	0.33	0.29	0.72
Decision 4	0.75	0.77	0.17	0.08	0.85
Decision 5	0.39	0.90	0.51	0.47	0.40
Decision 6	0.04*	0.27	0.98	0.15	0.10
Decision Total	0.24	0.12	0.86	0.30	0.15

4.3. Evaluation of Model Assumptions of Linear Regression

Linear regression forms the main component of the quantitative analysis in this study. As such, a brief evaluation of the model assumptions of the linear regression has been conducted. However, with n at 117 the Central Limit Theorem applies to this dataset. Nonetheless, the process of evaluation of the parametric assumptions of linear regression may provide further insight into this data set, later analysis, and potentially future direction for research using this data set.

4.3.1. Emotional Intelligence and Decision-Making Data Set

The assumption of linearity for EI and DMI can be confirmed as approximately normal by a line of best fit that shows a slight positive linear relationship, Figure 4 (a). Additionally, a quadratic prediction plot, Figure 4 (b) shows that while there are outlier values that are causing small deviations in the fitted values, overall, the plot remains approximately linear. The assumption of homoscedasticity of residuals for EI and DMI can be confirmed as a Cameron & Trivedi's decomposition of IM-test accepts the null hypothesis of heteroskedasticity as $p > \alpha = 0.6644 > 0.05$. Further, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity of residuals accepts the null as $p > \alpha = 0.3879 > 0.05$. The residuals are not normally distributed as $p < \alpha = 0.00010 < 0.05$, however, as $n = 117$ the Central Limit Theorem may be applied to this data. Table 3 shows that while the individual dimensions of EI have homoscedastic residuals, none have an individual normal distribution. However, the Central Limit Theorem will be applied in this case, hence only the main dimensions being tested in this way.

Table 3. EI Dimensions Assumptions Tested

EI Dimension	Cameron & Trivedi	Breusch-Pagan /	Shapiro-Wilk
	IM-Test	Cook-Weisberg Test	W test
SEA	0.1703	0.3321	0.00017
OEA	0.1821	0.1138	0.00041
UOE	0.5404	0.9845	0.0008
ROE	0.5057	0.5351	0.0008

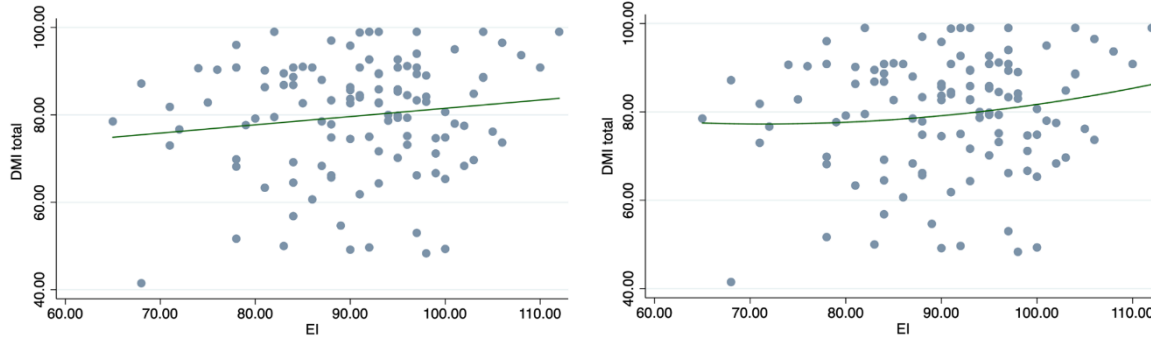


Fig. 4. a) Line of best fit for EI v DMI, and b) quadratic prediction plot for EI v DMI.

4.4. Linear Regression: EI and DMI

Complete simple linear models we constructed and tested for each of the 35 combinations between EI and DMI. This was undertaken in both STATA and Microsoft Excel. Table 4 presents the regression data in the form coefficients of determination give as the percentage of explanation (R2 as a percentage).

Table 4. Percentage of Explanation for EI and DMI

	SEA	OEA	UOE	ROE	Total EI
Decision 1	3.37%*	6.37%*	0.00%	1.93%	4.45%*
Decision 2	0.02%	6.37%	1.22%	1.42%	0.24%
Decision 3	0.04%	0.92%	0.84%	0.97%	0.11%
Decision 4	0.09%	0.73%	1.67%	2.62%	0.03%
Decision 5	0.65%	0.075%	0.38%	0.45%	0.63%
Decision 6	3.63%*	0.01%	0.00%	1.82%	2.36%
Decision Total	1.22%	2.51%	0.03%	0.93%	1.82%

In Table 4 values that were outlined as having a statistically significant correlation are presented with an asterisk to show the R2 scores. SEA explains 3.63% in the variation of decision-making scores for scenario 6. Decision-making scenario 1 shows multiple influences as total EI explains 4.45% of the variation in score, SEA explains 3.37% of the variation in score, and OEA explains 6.37% of the variation in score.

4.5. Qualitative Findings

The figures in the Appendix show the qualitative code trees, detailing the prevalent codes and their relation to one another and the given thematic categories. The main thematic categories in the open-ended survey answers are: 'Fear' (Fig. A1), 'Safety' (Fig. A2), 'Organisational Impact' (Fig. A3), 'Option Flexibility' (Fig. A4), 'Planning' (Fig. A5), 'Managing Others' (Fig. A6), 'Emotions' (Fig. A7), 'Emotional Regulation' (Fig. A8), 'External Pressure' (Fig. A9), and 'Sense of Self' (Fig. A10). The purpose of the code trees is to highlight the overall direction of the qualitative data before validating the quantitative data. By doing it this way, future qualitative research may be better directed.

4.5.1. Overall EI Comparison

Table 5 shows the instances of prevalent codes in 20 highest EI scoring participants who responded to open-ended questions, and the lowest EI scoring participants who responded to open-ended questions. Separate column heat maps were used to ensure the respective maximal values (highest count) corresponded to the 'hottest'. Significant differences in the prevalence of codes include those that are bolded and underlined in Table 5 to show that there is a contrast in the heat-map assigned colour of more than one shade. From Table 5 we can see that on average, high EI individuals answered prioritising 'authority', 'exhausting all options', 'facts', and 'purely technical/rational' more than low EI individuals. In contrast, low EI individuals answered prioritising 'prioritisation of safety', 'gathering all information', 'inflexible/intransigence' and 'alternates' more than high EI individuals. To explore these differences, Table 6 show examples that are representative of the group will be used to illustrate the low and high EI individuals answers to scenario 1, which detailed the decision of taking the extra time to do a detailed weather check even though it is a clear day. The quantitative findings suggest that this decision-making scenario overall is more influenced by EI than the other scenarios.

For Table 6 it is interesting to note that scenario 1 was highlighted in quantitative findings as being influenced by respondent EI levels than other scenarios. Table 6 shows that for the high EI individuals, even when the DMI is low the participant notes that this answer would not apply if they were to have passengers. For high DMI examples, the emphasis is placed on the minimal time burden, and not making assumptions about future circumstances. Conversely, for the low DMI examples, the same themes of time-burden and making assumptions about future circumstances is emphasised from the opposing side.

Table 5. Overall Qualitative Indicators

Code	Low EI	High EI
Accountability	10	3
Alternates	<u>27</u>	<u>14</u>
Appeal to Colleague	10	7
Authority	<u>7</u>	<u>13</u>
Communication	11	7
Consequence	10	6
Creating a Big Picture	11	5
Double Check	12	13
Ensuring Safety	10	6
Exhausting All Options	<u>8</u>	<u>13</u>
Facts	<u>9</u>	<u>12</u>
Gathering All Information	20	10
Inflexible/Intransigence	32	14
No Emotion	10	10
Prior Knowledge/Experience	9	9
Prioritisation of Safety	43	28
Purely Technical/Rational	21	36
Responsibility	14	13
Risk Assessment	10	5
Situation Dependent	8	9
Strict Adherence to Rules	16	19

Table 6. Overall EI Examples Scenario 1

EI	DMI	Quote
High	90<	'It's quick and easy to check the weather so why not be thorough in preparation?'
High	>30	'... If it looks to be non-adverse, I do not put in a huge amount of time studying the weather for a [solo navigation]. If I had passengers, this does not apply, I put in a lot more effort.'
Low	90<	'The weather is always changing and therefore you should never second guess your situation and the possible development of poor weather conditions.'
Low	>50	'... If everything looks 'the same' I am likely to skip / gloss over the more comprehensive weather review for the sake of time / focusing on more relevant aspects. Ultimately, weather where I fly is not that unpredictable. I know what to expect in a given day / season...'

5. Discussion

5.1. Research Findings

Theorised in George (2000) and Gupta & Kumar (2015), and also found in Brown, George-Curran & Smith (2003) and Causse et al. (2013), while the total EI score may not have a positive correlation to other variables, isolated dimensions of EI may potentially still describe a variance in variables. As such, while H0,1 was accepted, that the average DMI and the total EI score were not correlated, H0,2 was still rejected, that the different dimensions of EI had no effect on DMI. As shown in Table 4, the variation in decision scenario 1 could be explained by SEA (3.37%), OEA (6.37%), and total EI score (4.45%). Interestingly, decision scenario 1 was a scenario with greater technical focus than other scenarios. Scenario 1 included no other hypothetical individuals and focused on respondents deciding whether to do a complete review of the weather even though the weather has been clear for a few days and still appears clear. Interestingly, as seen in 'Table 5.7.1b', example quotes from those with a high EI on decision scenario 1, even if they would be unlikely to do the thorough weather check they note in the comment that the answer of >30% likelihood would not be accurate if the aircraft had passengers other than themselves. This may suggest that those with a higher EI level who would be unlikely to perform the weather check due to time-burden or confidence in the weather would respond differently if others were also implicated in consequences. This reveals insights into the decision making involved in this specific type of action, where spikes in accidents are observed in months associated with

overconfidence and good weather (Ayie, Murray et al. 2020), even though the phenomena is about flying into bad weather.

Similarly, individual dimensions of EI were able to explain variance in scenario 6. Table 4 confirmed that 3.63% of the variance in decision scenario 6 could be explained by SEA. Decision scenario 6, which can be viewed in detail in Appendix 7, asked respondents whether they would stand up to their boss on the grounds of safety when asked to go through with a take-off for a charter flight without meeting the performance requirements due to changes in weather. Codes for this scenario for the overall cohort revolved around 'purely technical/rational', 'limitation of machine', 'remaining calm', 'personal values', and 'self-efficacy' (Appendix, Code trees).

5.2. Theoretical Implications

For the current body of EI and decision-making literature, a potential implication of this research is the link in qualitative data to self-efficacy, which is a prominent theme in HRM literature on decision making and EI. As seen in the Appendix 'self-efficacy', including the codes 'assertiveness', 'authority', and 'confidence', was a prominent feature highlighted in the qualitative data that explained respondents' thoughts and feelings about the scenarios, and if any other non-technical factors feature in their decision-making process. This is an interesting find as the theoretical HRM work on EI and decision making feature self-efficacy as an important aspect in the link between EI and decision making, especially in terms of career choice, commitment to career, and career-related choices (Brown, George-Curran et al. 2003, Jiang 2016). Self-efficacy in high-consequence industry, or high-stress decision making is currently a lesser-studied area, potentially as other themes are considered more important than self-efficacy in high-risk decision making. However, specifically for pilots, the theme of self-efficacy is important as many respondents detailed the importance of confidence in executing tasks in a safe manner and standing one's ground to others who may not be prioritising safety.

The context in which EI and decision making was researched was directly affected by the high-consequence and potentially stressful nature of the aviation industry, with scenario 1 showing the most significant correlation with EI in decision making. Scenario 1 involved respondents deciding to make a whether check even if the weather has appeared clear for a few days and still looks clear. A potential inference from scenario 1 responses showing correlation with total EI, SEA and OEA could be that in the level of recognition, assessment, and regulation of emotion in oneself and others associated with SEA and OEA could in consequence allow for other cognitive functions involved in gathering and processing information to be improved in scenario 1 due to emotional regulation. Other scholars have acknowledged the possibility that technical and information-based activities may be improved by a higher EI due to the regulation of emotion allowing for more precise cognitive function (George 2000, Seo and Barrett 2007, Alkozei, Schwab et al. 2016). For similar research on decision making in aviation, this finding may add to other studies that have theorised that emotional regulation, on some level, can help memory, attentiveness to task, cognitive function, and ability to process information (Wiener 1985, Jones and Endsley 1996). If emotional regulation were to potentially have an impact on other cognitive functions that aid decision making and technical factors, potential implications also arise for the case that a higher EI will possibly lead to career success and productivity in the workplace as claimed by Goleman (1996, 2017), China, Anantharaman & Tong (2011), and Johnson & Indvik (1999).

5.3. Practical Implications

Potential practical implications of this paper are directed at HRM and the context of high-consequence industries, and certain things specific to the aviation industry. Firstly, organisational culture and psychological safety were prevalent in the coding of the qualitative data. As seen in HRM theory presented by Zhou, Zhu & Vredenburg (2020), psychological safety plays an important part in EI and decision making. This aligns with other studies in CRM in the aviation industry where individual and team psychological safety is imperative for implementing a just culture that prioritises safety (Chute and Wiener 1996, Baron 1997). Table 6 highlights some examples of respondent's thoughts on organisational culture and the ability to confide in management if you have made a mistake. 'Getting caught out', 'shame', 'guilt', 'embarrassment', and 'withholding information' were some codes prevalent that could have practical implications for the aviation industry, and potentially other safety critical industries such as medicine, where the organisational ideal is that of a just culture. However, some respondents still expressed that they felt that organisations they were currently with or had been employed by in the past were more punitive than just.

It is interesting to note that some of the scenario's capture different aspects of safety. Scenario 4 is distinctively different, given the nature of the operation, the assumptions made by the respondents about the aircraft, and

importantly it was the most inconsequential. That is, since the event happened at the end of the flight, and the pilot would not likely be the next to fly that specific aircraft, this scenario does not provide any direct risk to the respondent. Similarly, scenario 5 to a lesser extent also features a lesser consequence, that would impact a friend but not the respondent directly. That is, there is a social risk but no safety risk. Codes in the qualitative data that could produce some practical implications for scenario 4 and scenario 5 included 'confidence', 'keeping to oneself', 'respecting others authority/autonomy', 'fear of consequence to friend', and 'rationalisation'. These findings may present implications for decision making in the workplace. Specifically, this could potentially implicate safety-critical industries where the prioritisation of safety is paramount even in scenarios where there isn't a direct threat to self in terms of physical harm or reputation.

A practical implication of interest for the aviation industry could be potential improvements in safety. While Wiener (1985) contends that the focus of the sterile cockpit theory and related research regarding fully automated cockpit would imply that emotional regulation is imperative in the cockpit. In terms of benefits for the aviation industry, EI training may increase the accuracy in decision making for pilots, as there was a correlation between dimensions of EI and specific decision-making scenarios.

5.4. Limitations and Weaknesses

While online surveys that include open-ended questions for mixed methods qualitative data collection have been shown to be a valid form of qualitative data (Braun, Clarke et al. 2020), this may also be viewed as a limitation when compared to purely qualitative works that focus on interviews or case studies. Further, scholars from different methodologies may view the convergent data variant research design as a limitation due to the differences in methodological rigor compared to purely quantitative or qualitative means. However, insofar as possible this research complies with the mixed methodology rigor as per Creswell & Plano Clark (2011) and Wisdom & Creswell (2013), while acknowledging that evaluating the level of rigor required of mixed methodologists as a standalone methodology, aside from purely qualitative or purely quantitative, remains an emergent discussion (Eckhardt and DeVon 2017, Harrison, Reilly et al. 2020). Further, another limiting feature of this research may be the smaller sample size that consisted mainly of Australian pilots. Future research in EI and DMI may firstly benefit from collecting data from a larger sample size, a sample that includes more respondents from outside Australia, or from different high-risk domains. Potentially, future research for the aviation industry may also look towards other moderators of EI and DMI, or other factors that may influence decision making such as technological advancements (Wiener 1985), situational awareness (Jones and Endsley 1996, Wiens 2017), and operational non-compliance case studies (Kharoufah, Murray et al. 2018).

5.5. Directions for Future Research

A direct follow up to this study investigating EI and decision-making will utilise the current dataset further. This will involve utilising the collected demographic data to investigate if gender, age, or experience has any moderation of the observed correlations. Based on the literature (Cabello, Sorrel et al. 2016), it is hypothesised that there will be a moderating effect of these demographic effect between the EI score and DMI. Based on that study, it would be hypothesised that there could be a difference between gender, and for age and experience, the observed inverted U could also be applicable. This future work will provide insights into how different demographic groups, especially younger less experience pilots, can best be prepared and trained in terms of their ADM, or aeronautical decision making (O'Hare 1992).

The qualitative results illustrated in the Appendix details the wide variety of coded data within the open-ended questions of the survey, which is a potential indication that purely qualitative research in this area would be a beneficial lens on EI and DMI in this area. Future work is proposed looking at each of these scenarios individually. That is, with almost all 117 respondents providing qualitative data to all of the provided scenario, there is the ability to provide insights and potential address the question of "why" these risks are taken and there is poor ADM. As previously mentioned, the responses about scenario one have direct implications for VFR into IMC research (Ayiei, Murray et al. 2020), along with scenario three. Similarly, results from scenario four could help with research into landing-flare related safety occurrences and hard landings (Wang, Ren et al. 2018). The other scenarios can be grouped together generally with insights into ADM, and the other types of human factors related safety occurrences from across the aviation (Kharoufah, Murray et al. 2018).

6. Conclusion

EI and decision making, particularly in pilots, is an important and yet unexplored area. EI, established in psychology and shifted to organisational psychology and HRM, has the potential to explain decision making factors in a wide range of industries. In particular, the aviation industry is a high-consequence and fast-paced decision-making environment, that often holds implications for other industries. The research questions had aimed firstly to identify the associations between EI and decision making in pilots. Secondly, identifying what role pilots perceived dimensions of EI to play in their decision making in simulated safety-critical scenarios. The data analysis was based on a mixed-methods analysis of an online survey, including the WLIES, decision making scenarios, and open-ended questions. From this, it can be concluded that while there is not an overall association between the total scores of EI and decision making, there are associations between specific decision scenarios and dimensions of EI. Decision scenario 1 had a positive correlation with SEA ($R^2 = 0.0337$), OEA ($R^2 = 0.0637$) and Total EI ($R^2 = 0.0445$), and decision scenario 6 had a positive correlation with SEA ($R^2 = 0.0363$). Qualitative data also directed importance from respondents' perspectives to themes such as 'Fear', 'Safety', 'Organisational Impact', 'Option Flexibility', 'Managing Others', 'Planning', 'Emotional Regulation', 'External Pressure', 'Emotions', and 'Sense of Self'. The results may potentially indicate the importance of EI in high-consequence industries, providing some insight into concepts such as the sterile cockpit theory, self-efficacy in different professions, and the other cognitive benefits of EI. While the sample size may limit the generalisability of the results, this research may provide new insight into EI and decision making in high consequence industries. To better understand the implications of these results, future studies could address a purely qualitative study in this area, or perhaps consider situational awareness and other cognitive functions that could potentially be moderated by EI. In the context of HRM research, research into EI and decision making in high-consequence industries has largely focused on group decision making or managerial decision making. The contribution of the prevalence of EI on individual decision making for a singular profession regardless of managerial status clearly illustrates the need for future research in high-consequence industries and the potential links between industries.

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Appendix A. Qualitative Code Trees

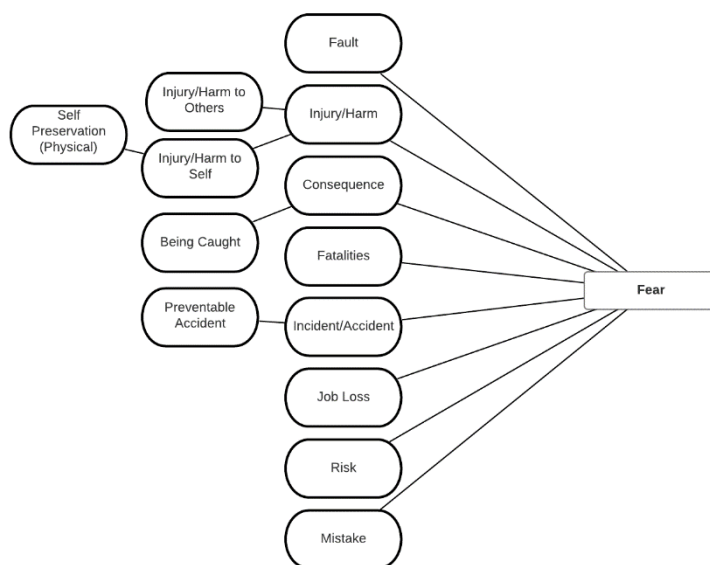


Fig. A.1: Fear Code Tree

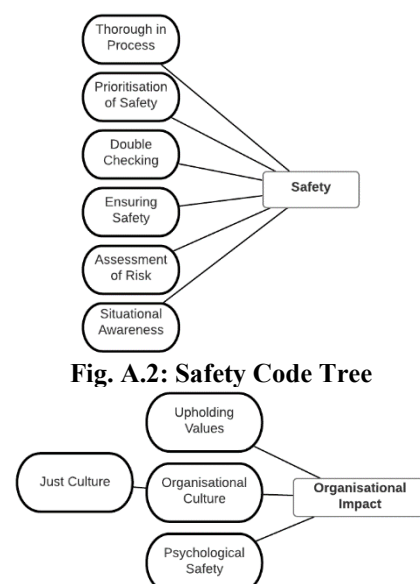


Fig. A.2: Safety Code Tree

Fig. A.3: Organisational Impact Code Tree

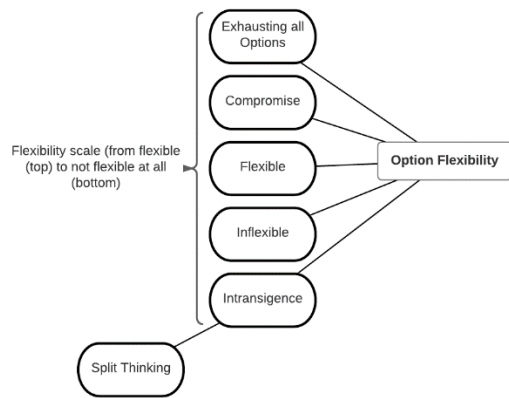


Fig. A.4: Option Flexibility Code Tree

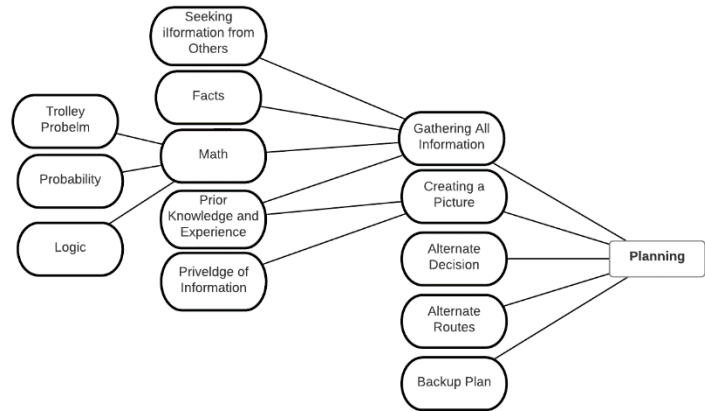


Fig. A.5: Planning Code Tree

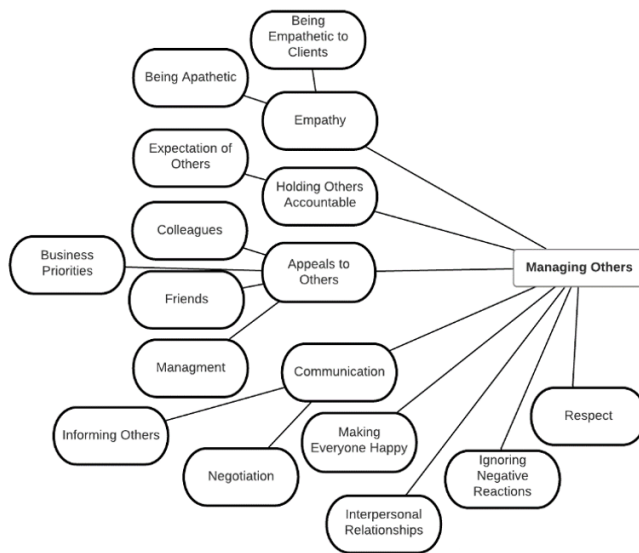


Fig. A.6: Managing Others Code Tree

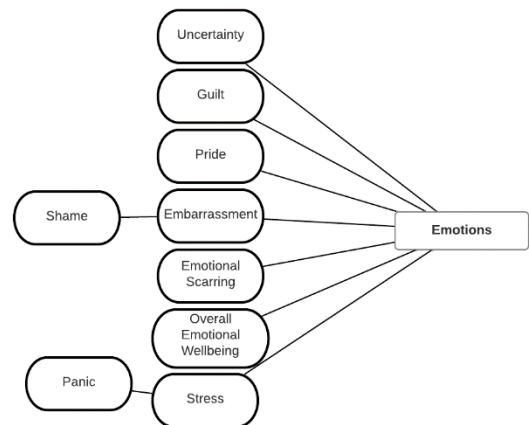


Fig. A.7: Emotions Code Tree



Fig. A.8: Emotional Regulation Code Tree

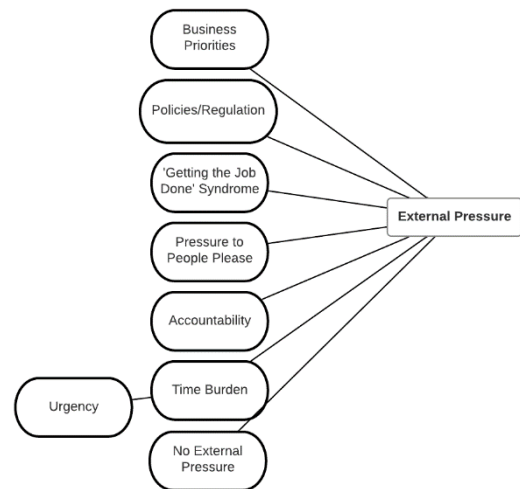


Fig. A.9: External Pressure Code Tree

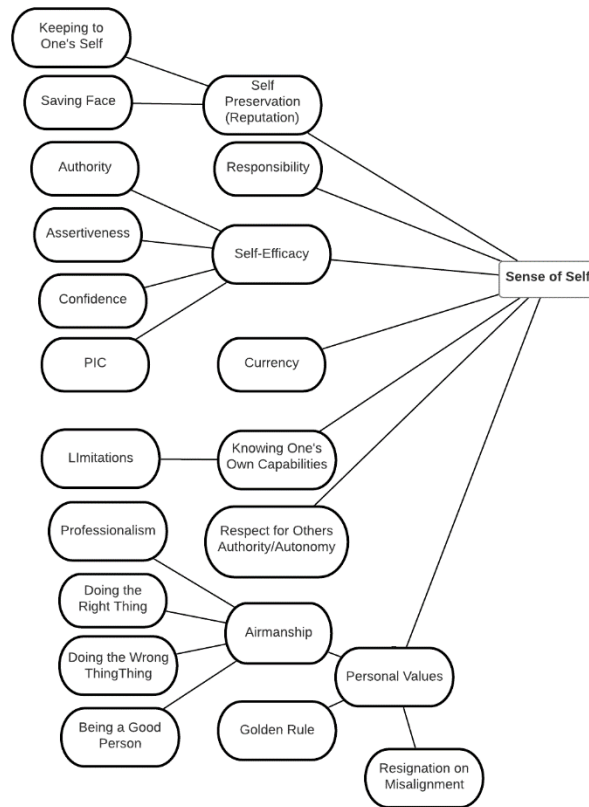


Fig. A.10: Sense of Self Code Tree

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