Emotional Intelligence, Situational Awareness, and Safety Performance: Pilots' Career Development

Thesis submitted by

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Journal articles in progress		
Paper	Title	Journal
Paper 1 (Chapter 4)	Emotional Intelligence and Safety Performance at Work: A Moderated Mediation Model of Situational Awareness	-
Paper 2 (Chapter 5)	Linking emotional intelligence to safety performance: The roles of situational awareness and safety training	Journal of Safety Research (published)
Paper 3 (Chapter 6)	Why and when do emotionally intelligent employees perform safely? The roles of thriving at work and career adaptability	Applied Psychology (published)

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Abstract

Emotional Intelligence (EI) has been recognised as a significant predictor of work performance, encompassing both task performance and contextual performance within organisational settings (2021). EI represents an individual's ability to perceive, regulate, and manage emotions to enhance reasoning and personal development (Mayer et al., 2008a). In certain safety-critical industries, such as aviation, mining, and nuclear plants, practitioners strive to improve employees' daily safety-related work behaviours. Safety performance, as a specific facet of work performance, shares common predictors (e.g., EI). However, scant empirical evidence exists concerning the impact of EI on safety performance, and the underlying mechanisms characterising this association remain poorly understood. This study has two primary objectives. First, it aims to investigate the potential positive influence of EI on safety performance, especially in high-risk occupations like aviation, and provide valuable insights that can be applied to enhance safety. Second, it seeks to provide empirical evidence regarding the variability of EI's impact on safety performance by exploring mediation pathways and context factors to offer practical suggestions that can be applied to enhance employee development in these critical industries. Notably, this thesis represents a pioneering endeavour in examining the role of EI on pilots' safety performance within the domain of Chinese airlines.

This study primarily employed a quantitative research approach to gather and analyse data. Participants were recruited from their roles as full-time pilot trainees in flight training colleges and full-time pilots servicing commercial airline companies. Both paper questionnaires and online surveys were applied to collect data through two distinct waves. The research framework of this thesis consists of three distinct models. The first model assessed the impact of EI on safety performance and the mediating effect of situational awareness in the relationship. The second moderated mediation model tested the

interrelationship of EI, situational awareness, safety performance, and training inadequacy. Adopting a similar analytical approach, the third model examined the moderated mediation involving EI, thriving, safety performance, and career adaptability. Findings not only align with extant literature regarding the EI-work performance relationship, but also provided new empirical insights for further research.

The present thesis expands the prevailing theoretical framework of EI and work performance by introducing situational awareness and thriving as mediating variables to examine the underlying mechanism underpinning the EI-safety performance relationship. By integrating these factors, this study helps to identify potential rationales for how EI can influence safety performance, thereby extended the effects of EI on other performance dimensions. In addition, this study explored the moderating role of training inadequacy and the findings presented new information for training managers to adopt tailored strategies to mitigate the negative influence of training inadequacy to achieve higher work and career performance levels. Furthermore, the examination of career adaptability as a boundary condition on the relationship of EI-safety performance provides useful information for HR managers to adopt requisite interventions, offering support and counselling services to the unique needs of pilots with lower mobility in career development. In China, the majority of pilots in airline companies have limited career mobility due to the long-term contracts they sign during their training in flight schools. These contracts are comprehensive and include provisions for extensive training costs covered by the airline companies, along with additional allowances for trainees. In return, pilots commit to completing the training successfully and serving the companies for an extended duration. As presented in Chapter 4 (Study 1), this study initially verified that EI positively influenced pilot trainees' safety compliance and safety participation behaviours. Unlike prevalent research that focused on general work performance among emotion-laden industries like teaching, retail sales, and

customer service, this exploration concentrated on safety-related performance, emphasising a domain traditionally viewed as being affected by cognitive capabilities. In addition, Study 1 revealed that EI exerted its indirect impact on safety performance through enhancing individuals' situational awareness. In Chapter 5 (Study 2), by using a distinct sample from Study 1, this study reconfirmed the positive correlation between EI and safety performance. Moreover, Study 2 examined how EI was activated to boost greater influence, which broadened the scope of Trait Activation Theory (TAT) from inherent personal traits to stable abilities. Lastly, in Chapter 6 (Study 3), building upon the findings of the preceding two studies, Study 3 investigated the relationship between EI and safety performance from the perspective of pilots' career development. Considering pilots perform their duty in the narrow confines of the flight deck, and the inherent immobility of pilots' career paths, this study questioned whether pilots would thrive in such a workplace and how career adaptability might affect their safety performance.

Conclusively, this thesis makes contributions to the present EI-work performance research by offering fresh perspectives on the complex interplay between EI and safety performance within the context of Chinese airlines. By exploring underlying mechanisms and probing boundary conditions, this thesis advances our comprehension of the multifaceted nature of EI and its implications for diverse performance dimensions. The results have practical implications for organisations, training managers, and HR practitioners, emphasising the importance of cultivating emotional intelligence, situational awareness, and career adaptability to foster safety and overall performance within high-risk industries, such as aviation.

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Chapter 1

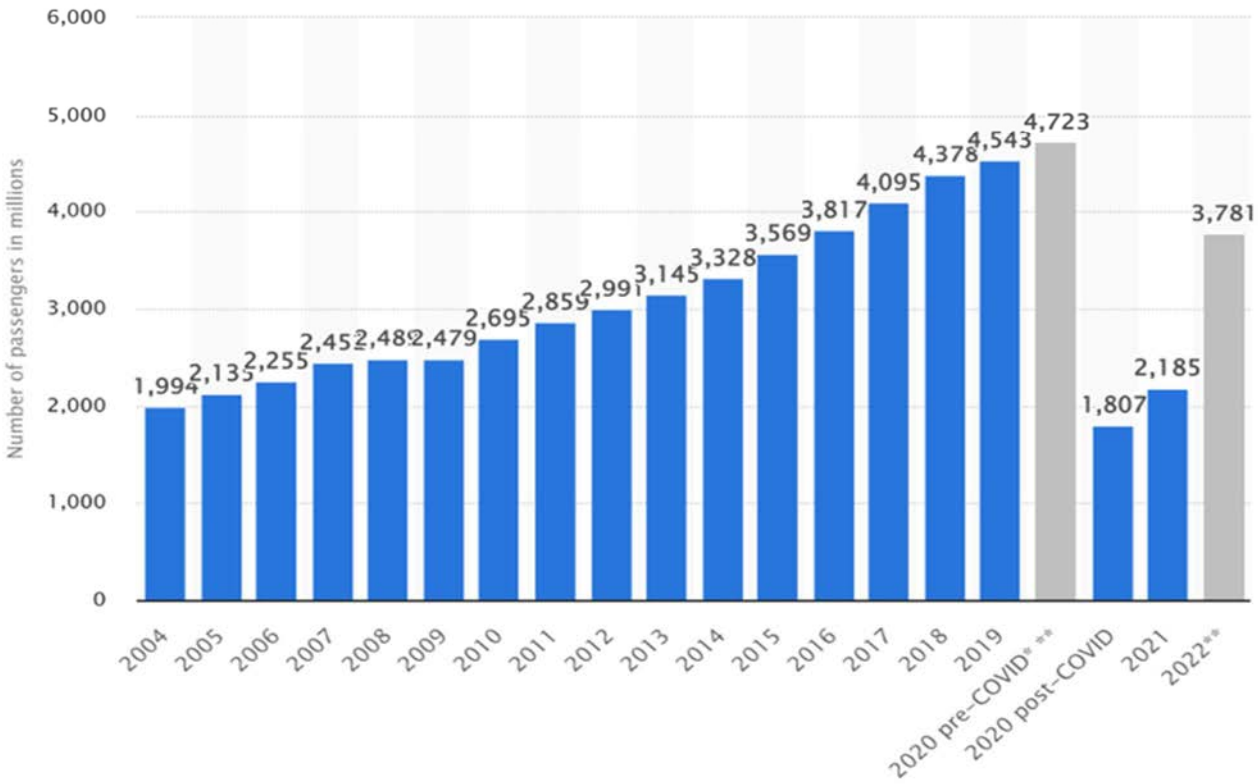
Introduction

Research Background and Objectives

Today, there are over one hundred thousand flights operating annually in the skies, totalling nearly 40 million flights globally before the Coronavirus pandemic. Figure 1.1 shows the trend of air traffic spanning over 16 years prior to 2022 (Statista, 2023). Ensuring the safe operation of flights as a priority concern for passengers and the aviation industry is driven by the tremendous cost and suffering caused by aircraft incidents and accidents (Bogdane et al., 2019).

Figure 1.1

Worldwide Air Traffic — Number of Flights in millions

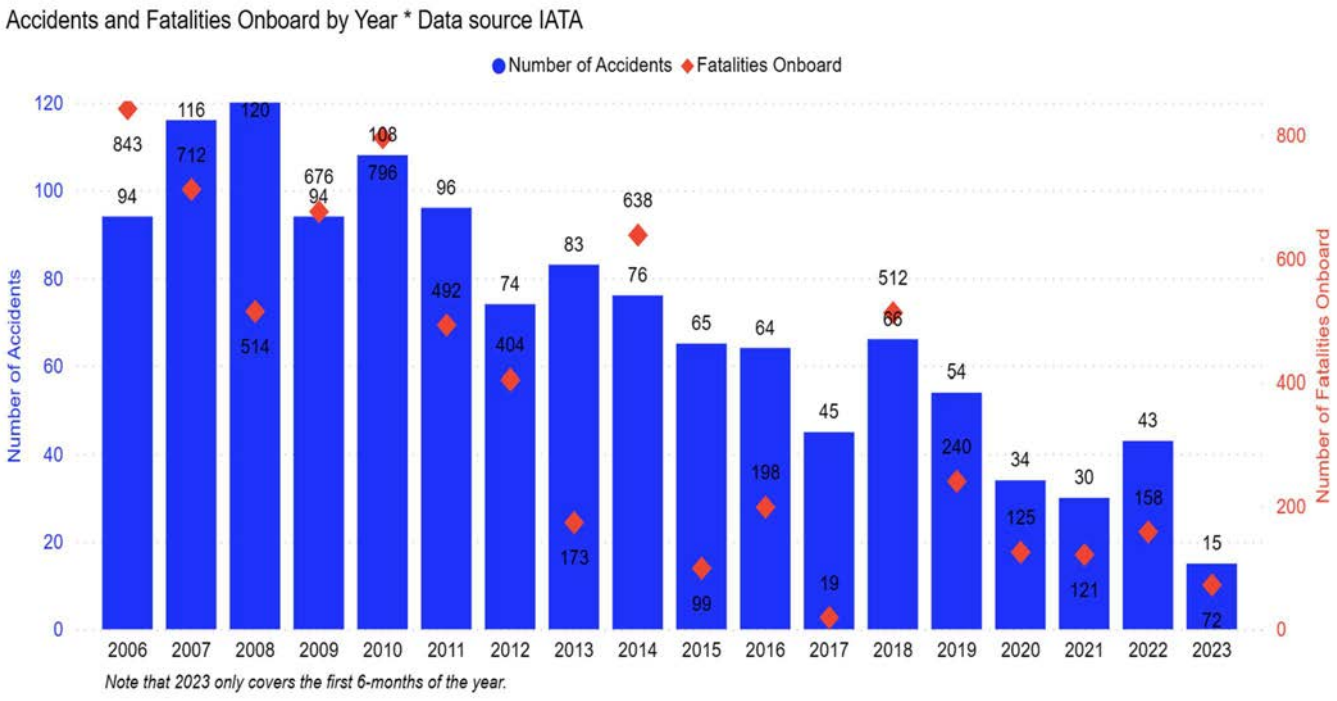


Note: From *Number of scheduled passengers boarded by the global airline industry from 2002 to 2022,* by Statista, 2022 (https://www.statista.com/statistics/564717/airline-industry-passenger-traffic-globally). In the public domain.

Although air travel is the safest form of public transportation, we still witness unsafe aviation events happening worldwide (Waycaster et al., 2018). According to the International Air Transport Association (IATA) Safety Report (2023), there were 39 commercial transport aircraft accidents (maximum take-off weight over 5700kg), leading to 158 fatalities in 2022 (Figure 1.2). In 2022, the number of worldwide accidents had reportedly increased to 39 from 29 in 2021, and the number of global fatalities associated with fatal accidents also significantly increased from 104 in 2021 to 160 in 2022 (Figure 1.3). Despite the application of new technologies and the delivery of new-generation aircrafts, the occurrence of aircraft accidents increased after the Coronavirus pandemic.

Figure 1.2

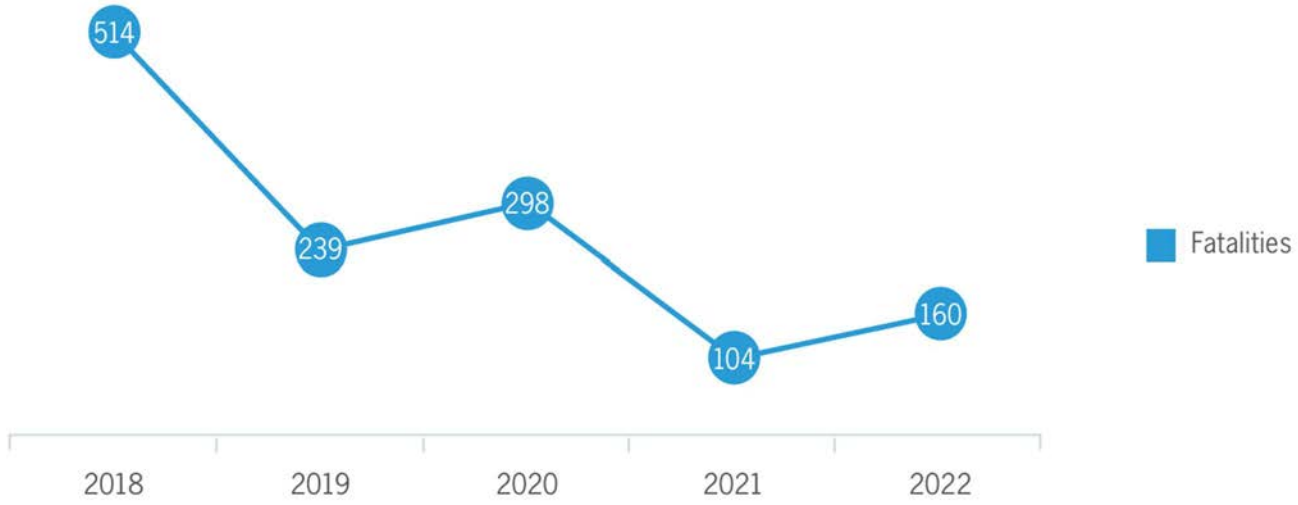
Number of Worldwide Air Traffic Fatalities 2006-2023



Note: From Interactive Safety Report, by IATA, 2023 (https://www.iata.org/en/publications/safety-report/interactive-safety-report). In the public domain.

Figure 1.3

Number of Worldwide Fatalities Trend 2018-2022

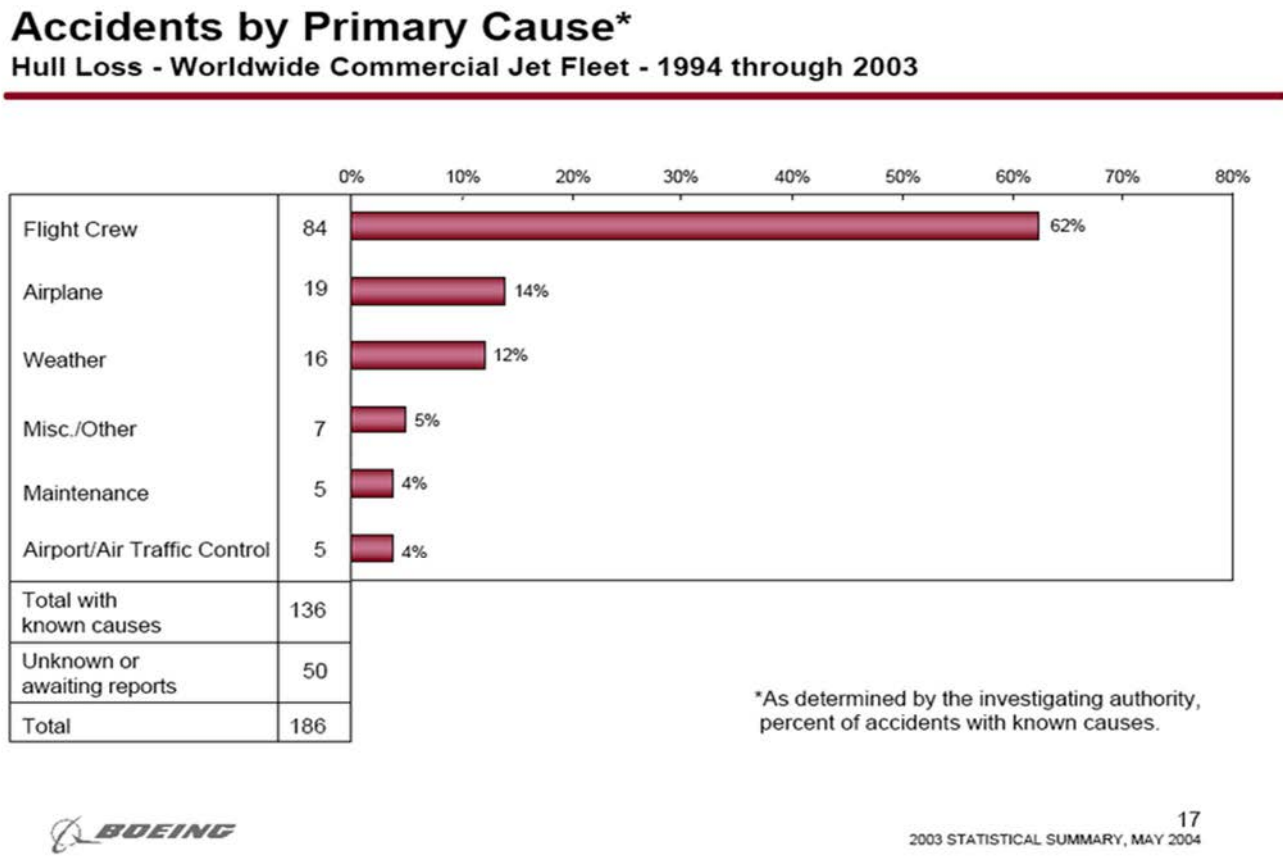


Note: From Interactive Safety Report, by IATA, 2023 (https://www.iata.org/en/publications/safety-report/interactive-safety-report). In the public domain.

What are the most common causes of aircraft accidents? The IATA has classified the primary contributing factors of aircraft accidents into categories such as pilots' errors, undesired aircraft state, weather conditions, and other latent factors ((ICAO), 2022) . While it's acknowledged that multiple factors can contribute to aircraft accidents, substantial research on human factors in aviation industry has consistently identified that pilot error is the most common cause of aircraft accidents (Kharoufah et al., 2018). Industry statistical data has identified that pilot error accounts for more than 50 per cent of the total causes attributed to aviation accidents (Kelly & Efthymiou, 2019; Li et al., 2001). Figure 1.4, derived from Boeing analysis ranging from 1994 to 2003 (Boeing, 2004), illustrates the predominant causes of aircraft accidents, highlighting pilot-related misbehaviour.

Figure 1.4

Aircraft Accidents by Primary Cause



Note: From Statistical Commercial Jet Summary of Airplane Accidents Worldwide Operations 1959 – 2003, by Boeing, 2004. In the public domain.

Over the past decades, the aviation industry has paid particular attention to safety issues and made enduring efforts to ensure and sustain safety performance. This commitment is approached through three main perspectives: the enforcement of high safety standards, the incorporation of new technologies, and the implementation of compressive training programs to enhance pilots' skills (Kelly & Efthymiou, 2019). For example, by adopting the latest cutting-edge technology and novel materials, major aircraft manufacturers such as Boeing and Airbus are building and delivering fourth-generation aircrafts featuring heightened reliable components and advanced components and systems (Timmis, 2020).

Meanwhile, civil aviation authorities make discreet regulations and advisories to guide aircraft operators to establish their own safety management systems (Stolzer et al., 2016). In addition, airline companies provide numerous training programs to improve pilots' proficiencies in operational skills. However, insufficient attention has been paid to the factors that influence the pilots' attitudes on flying safety. Fundamentally, the pilots' behaviours are subject, to a large extent, to their lack of safety awareness (Kelly & Efthymiou, 2019; Stanton et al., 2001). For commercial pilots, as the direct operators of aircrafts, being able to fly safely is one of their most important responsibilities. Pilot error, specifically a lack of situational awareness, has been statistically identified as the predominant cause of aircraft accidents. Situational awareness, as defined by (Endsley, 1999a), refers to the capability to perceive, analyse information, and take proactive actions to prevent adverse developments in the workplace. During a flight, pilots must continuously monitor essential aircraft parameters such as heading, altitude, and airspeed, using onboard displays to ensure the aircraft is on the right track. They must also communicate with the air traffic controller and address inquiries from cabin crew simultaneously. To operate a sophisticated machine like a modern jet aircraft, it is critical to equip the pilot with the capability of making accurate decisions upon interpreted information. According to the IATA safety report (2023), most of the aircraft incidents and accidents were attributed to pilots' unsafe behaviour (De Sant & De Hilal, 2021; Huang, 2020). The errors committed by pilots often fall into two categories: faulty judgment and incorrect, inappropriate action (Glendon & Litherland, 2001; KILIÇ, 2019). For example, pilots' inappropriate responses to unexpected or unsafe circumstances contribute significantly to fatalities (Belcastro & Foster, 2010; Kale et al., 2022; Kozuba, 2011). Therefore, it is particularly important to study how to improve pilots' safety performance.

I have been working in the aviation industry for over 20 years with experience ranging from aircraft maintenance, engineering training, and pilot training in Australia and China. Over the past decade, I have experienced several aircraft incidents/accidents which were all attributed to the pilot's unsafe performance in various situations. Between 2000-2020, statistics show that there were four fatal commercial aircraft accidents causing 319 fatalities in mainland China. The analysis of the investigation reports for those four fatal accidents indicates that pilot error was the primary contributing factor. I have also noticed that greater efforts to improve flight safety have predominantly been focused on enforcing strict safety principles, using the safest generation aircrafts, and pilots' operational proficiency training. There appears to be limited attention on fostering the inherent traits and capabilities of pilots that are directly related to safety behaviours. This study aims to investigate how personal abilities and skills, such as Emotional Intelligence (EI) and situational awareness, can enhance pilots' daily safety behaviour from an individual perspective.

Inspired by EI-work performance theory, the main research stream of this thesis focused on testing the interaction between EI and safety performance. Additionally, considering prior studies' findings regarding the inconsistent predictive effects of EI on work performance, mediators such as situational awareness and thriving were incorporated into this relationship to disclose the underlying mechanism. To gain a more comprehensive understanding of when EI can impact pilots' safety performance, contextual factors, such as training inadequacy and career adaptability, were integrated into the final research model.

In the following sections, I will elaborate on the key variables, address research questions, and outline the overall research model.

Main Variables

Safety Performance

In prior safety domain research, safety performance has commonly served as a metric for assessing both organisational safety outcomes and individual safety behaviours. On one hand, it might refer to an organisational metric for safety outcomes, such as the number of incidents per year. On the other hand, it could also refer to a metric for the safety-related behaviours of individuals. It is critical to define the context of safety performance because each construct has different antecedents and consequential relationships. The mixed use of safety performance poses challenges, as safety-related outcomes and behaviours have distinct antecedents and varying sequence relationships. Following the safety performance structure proposed by Neal and Griffin (2002), in this thesis, safety performance is specifically defined as a special aspect of work performance rather than organisational safety results. This personal-level conceptualisation offered a reliable and measurable criterion for studying organisational behaviours (Christian et al., 2009).

With the acknowledgement of this two-dimensional safety performance framework, scholars have conducted numerous studies in safety-critical industries such as nuclear power plants, manufacturing, oil and gas explorations, and aviation (Clarke & Robertson, 2005; Syed-Yahya et al., 2022). Specifically, safety performance refers to individuals' behaviours that can enhance and uphold safety within the workplace environment. In the domain of work behavioural research, work performance can be categorised into two distinct dimensions: task performance and contextual performance. These categorisations are based on whether the behaviour contributes to or detracts from the accomplishment of organisational goals (Motowidlo et al., 2014). Grounded on the foundation of a work performance theory frame, Griffin and Neal (2000) presented a safety performance conceptual framework consisting of two dimensions: safety compliance and safety participation. In particular, safety compliance

refers to those fundamental safety-related behaviours that directly influence workplace safety, such as adhering to safety protocols and using personal protective equipment. On the other hand, safety participation refers to behaviours that may not directly impact safety but can help to sustain or support safety (Hon et al., 2014). Similarly, considering that safety performance is a specific facet of work performance, factors that influence work performance (task performance and contextual performance), both at the individual and organisational level, are most likely to exert potential impacts on safety performance (Neal & Griffin, 1999).

The literature demonstrates that many factors are associated with safety performance, such as knowledge (Griffin & Neal, 2000), skills (Mavin & Dall'Alba, 2010), work experience (Hardy & Parasuraman, 1997), personality (Clarke & Robertson, 2008), cognition (Young, 2008), emotion (Butcher, 2002), and environmental factors (Byrne & Kirlik, 2005). Although this stream of research has contributed significantly to our understanding of the antecedents of safety performance, there are still some factors currently underexplored. Christian et al. (2009) point out that continuous effort should be devoted to exploring, identifying, or verifying potential predictors for employees' safety performance. For example, Siu et al. (2003) argued that emotions can affect employees' perceptions of safety climate and their safety performance. However, no specific studies have provided strong support for this argument, and it is therefore unclear whether and how emotional factors could contribute to pilots' situational awareness and attention to safety.

Emotional Intelligence (EI)

Recently, Emotional Intelligence (EI) has been identified as one of the most studied predictors of employee performance (Hughes & Evans, 2018; Mayer et al., 2008a; Newman et al., 2010). EI refers to a set of mental abilities related to perceiving, identifying, understanding, and managing emotions (Mayer et al., 2016). For instance, Wong and Law (2002) found that EI could lead to increased work performance among Hong Kong Chinese employees. Similar

trends have been observed in different countries, such as the United Kingdom (Dulewicz & Higgs, 2000), Australia (Jordan et al., 2002), and Canada (Goldenberg et al., 2006), where individuals with higher levels of overall EI received superior work performance ratings compared to their counterparts with lower levels of EI (Lopes et al., 2006). Furthermore, Farh et al. (2012) observed that in the USA, higher EI tends to motivate employees to perform better in their job duties and responsibilities. These collective findings have provided compelling evidence of the positive effects of EI on employee performance across a range of contexts and settings. While existing research has predominantly concentrated on the relationship between EI and work performance, it's essential to answer the call that Christian et al. (2009) argued for: a distinct examination of safety performance. They emphasised that even though safety performance shares some commonalities with work performance, it deserves independent examination due to its inherent differences from task, contextual, or adaptive performance. This distinctiveness justifies the need for separate research and analysis. To my best knowledge, the impact of EI on safety performance, both in general and particularly among pilots, remains largely unexplored in the existing body of literature. Few, if any, studies have been conducted to investigate this relationship comprehensively. Consequently, there exists a significant research gap concerning the understanding of how EI influences safety performance, with a particular emphasis on its implications for pilots. The proposed PhD research seeks to advance this area by exploring EI as an antecedent of safety performance among commercial aviation pilots.

Although the relationship between EI and work performance is well-established in previous research (Daus & Ashkanasy, 2005; Krén & Séllei, 2021; Lopes et al., 2006), not many empirical studies have been observed to clarify the underlying mechanisms of this relationship — in particular the psychological process through which EI positively affects employees' work performance. A more effective understanding of this process may

potentially assist employers in developing tailored strategies to improve employees' work performance. As mentioned before, my proposed research will focus on the safety aspect of work performance and attempt to explore this unexplored mechanism to explain fully the relationship between EI and safety performance.

Situational Awareness

In the aviation industry, situational awareness is a critical competency for pilots, as highlighted by (Endsley, 1995a, 2015a). It refers to "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Endsley, 1995a, p. 66). With the application of modern automation technology on aircraft systems, pilots' manual operation of aircrafts also transfers into monitoring the highly automated machines. This shift placed greater demands on their information processing capabilities and situational awareness (Endsley, 2018). Endsley (1999a) states that situation awareness forms the basis of decision-making and performance within aviation. Over the past few decades, situation awareness has been widely studied since it is a critical predictor of human performance and valuable explanation of human error (Van Winsen et al., 2015). Reports show that lose or poor situational awareness is a major factor in accounting for over 80% of commercial pilots' errors and mistakes and clearly has severe safety implications. This is in line with the argument that levels of situational awareness directly affect pilots' judgments and responses to unexpected situations, thereby impacting safety performance (Endsley, 1999a). For example, on June 1, 2009, Air France Flight 447 disappeared over the mid-Atlantic with no immediate indication of the cause. The subsequent two-year investigation revealed that a critical loss of situational awareness was the primary contributing factor. It occurred when the pilot disengaged the autopilot, leading to confusion and despite the copilot's efforts to take control, he struggled to fully comprehend the situation. This accident underscores the critical importance of

maintaining situational awareness and the severe consequences that can arise when it is compromised in aviation. Thus, it is critical for the pilot to keep a high level of situational awareness during the process of performing any tasks that may raise safety issues.

On the one hand, it was found that individuals might lower or lose situational awareness when they struggle to distribute attention or manage their emotions properly when confronting stress; a typical psychological state frequently experienced by pilots during flying (Endsley, 1999b). Additionally, previous evidence has also shown that EI assists in coping with task-induced stress (Matthews et al., 2006) and helps with decision-making under pressure (George, 2000). The evidence collectively suggests the potential role of EI in the shaping of situational awareness. Although prior studies have directly or indirectly shown that EI is potentially predictive of situational awareness and situational awareness tends to influence safety performance, no research has explicitly examined whether the EI-safety performance relationship can be mediated by situational awareness. In this thesis, situational awareness will be incorporated into the research model as a mediator in the EI-safety performance relationship, to explore the mechanism underlying this relationship.

However, there is some debate among scholars regarding the consistency prediction of EI on work performance (Joseph, Jin, Newman, & O'Boyle, 2015; Rode et al., 2007; Zeidner et al., 2004). This inconsistency in findings might be subjected to various boundary conditions that can affect the relationship between EI and work-related outcomes, including performance. While prior research has examined several boundary conditions such as personality (Rode et al., 2007), positive and negative affect (Kafetsios & Zampetakis, 2008), job context (Farh et al., 2012), and job control (Abraham, 2004), numerous other factors remain unexplored (Ernest H. O'Boyle et al., 2011). This thesis aims to contribute to this aspect of the topic by focusing on the moderating roles of two career development variables: training and career adaptability.

Career Adaptability

In mainland China, civil aviation pilots often face unique challenges and constraints, particularly in terms of career development opportunities. One significant contributing factor to these challenges is the limited career mobility due to the binding of training and employment contracts (Gao, 2016). Unlike in many other Western countries, where aircraft flight training is often self-financed, in mainland China, aircraft flight training (i.e., flight technology), is offered as a tertiary degree, and most trainees are recruited and founded by airline companies rather than paying for the cost by themselves (Shi, 2022). The recruitment process for future pilots in China starts early; representatives from various airline companies join together with flight training colleges at universities, and interview candidates for the flight technology major. When airline companies and candidates sign the contracts, the trainees will start their career path earlier than students in other majors. Furthermore, airline companies offer other benefits, such as a monthly living allowance, uniforms, and gift cards , as per the standards for internship employees. After completing their university flight training program, these trainees will directly join the sponsoring company, and begin a series of complicated training schemes, including aircraft type training, simulator training, and recurrent training. These specially tailored training programs ensure they to acquire the qualification to operate commercial aircraft practically (Q. Li et al., 2021).

However, this company's sponsoring training mechanism leads to significant consequences for future pilots. Since their training is funded by airline companies, trainees have limited freedom in choosing their future employers. Their early career paths are predominantly determined by the companies that sponsored their four years training at university. While the financial support relieves trainees' burden of training and living costs, it also imposes substantial obligations. If they choose to resign or are dismissed, they will face a considerable repayment amount. This legal obligation leaves pilots few opportunities to

select other airline companies or pursue some other occupations (News, 2019). Given these career constraints, it is worth exploring whether career adaptability serves as a critical context factor influencing the relationship between EI and safety performance in this professional group. Understanding how pilots adapt themselves to these imposed challenges could provide new insights into how they manage their emotional and professional challenge, ultimately affecting their performance in high-risk industry.

Career adaptability refers to an individual's readiness and resources for coping with current and anticipated changes, transitions, and traumas in their occupational roles (Savickas, 2013). When facing unforeseen circumstances or constraints, the ability to adapt to those career-related changes can significantly impact one's mental health, job satisfaction, and performance (Fiori et al., 2015; Haynie et al., 2020; Ran et al., 2023). In the context of civil aviation pilots in mainland China, where career mobility is limited by company-sponsored training mechanisms and binding contracts, career adaptability can play a role in navigating these professional challenges.

Existing studies support that individuals with high career adaptability are better equipped to manage stress, stay motivated, and maintain high levels of job performance despite various career challenges (Haenggli & Hirschi, 2020; Johnston, 2018; Rudolph et al., 2017). This career adaptation ability is important for civil aviation pilots, who work under strict regulations and encounter dynamic complex situations. High-level adaptation ability equips them with confidence in managing the pressure in their roles, but also enables pilots to utilise psychological and emotional resources (i.e., EI) in long-term career sustainability. Given the challenges faced by Chinese pilots (e.g., limited choice in employers, potential financial repayment, and lack of career flexibility), examining career adaptability may gain insights into how these professionals cope with their career constraints and how this coping mechanism interacts with their emotional intelligence to influence safety performance.

Thriving at Work

In addition to the constraints of limited career mobility, civil aviation pilots are also subjected to intense occupational stress that can significantly impact their safety performance (Cahill et al., 2021; Vallès-Català et al., 2021). This stress arises from the inherent operation characteristics of the civil aviation industry, such as irregular schedules, long flight hours, and immense responsibility for passenger safety. Pilots often work in high-pressure operation environments (e.g., high-frequency storm in summer, and snow and icing in winter), where they need to make quick decisions while maintaining optimised physical and mental. The continuous need to perform at high tension levels, can lead to chronic stress, which, if not appropriately managed, can degrade safety performance (Cahill et al., 2021; Masi et al., 2023). The cumulative effects of these stressors highlight the warrant of exploring psychological resources (e.g., thriving at work) to mitigate the negative influence of such stressors.

Thriving, a psychological state characterized by the joint experience of vitality and learning, plays a crucial role in mitigating the negative effects of such stress (Gerbasi et al., 2015), thereby improving individuals' work performance (Goh et al., 2022). Thriving at work, described as a psychological state of a sense of continuous learning and a sustained sense of vitality (Spreitzer et al., 2005), has been extensively studied in the context of organizational behaviour. Research has consistently shown that thriving has positive relationship with various work outcomes such as task performance, job satisfaction, and mental health (Z. Jiang et al., 2021). Thriving enables individuals to continuously learn and grow while retain certain energy level to handle stress. This suggests that fostering a thriving work environment can help pilots meet the psychological demands of their roles and contribute to safer operations.

Recent a significant amount of systematic review research demonstrated that thriving

at work has a positive effect on various workplace outcomes such as task performance, job satisfaction, and mental health (Alothmany et al., 2023; Jiang et al., 2020; Kleine et al., 2019). When pilots thrive, they feel energized and engaged in their work, which enhances their ability to manage stress effectively. This psychological resource may help them maintain a high level of cognitive function during flights, and ensure that they remain vigilant and responsive to potential safety threats. Given the high-risk nature of aviation, where even minor lapses in attention can lead to severe consequences, examining the role of thriving is essential for understanding how pilots can maintain optimal safety performance under pressure.

Training Inadequacy

Apart from the above-mentioned personal psychological resources that can impact pilots' safety performance, there are some organisational-level factors that also contribute to their unsafe behaviours. For example, numerous aircraft incidents/accidents investigation reports have identified that lack of training is a root cause of unsafe performance (Kelly & Efthymiou, 2019; Small, 2020). China, as a member of the International Civil Aviation Organization (ICAO), adheres to international standards for pilot training. In many cases, the training standards set up by Civil Aviation Administration of China (CAAC) are even higher than those requirements. Airline companies, in particular, often have stricter standards to meet national authority requirements. While the established standards are rigorous, the true challenge lies in the effective implementing these training programs (Cline, 2018). The gap between the required training and what is actually provided can lead to pilots' skill degradation, increased stress level, and ultimately, compromise safety performance.

Without sufficient training, pilots can struggle to take appropriate actions to operate aircraft when encountering unexpected challenges (Lyu et al., 2019). When pilots are inadequately trained, they are more likely to make incorrect decisions, fail to follow standard

operation procedures, or react inappropriately in emergency situations (Small, 2020; Xue & Fu, 2018). Addressing the safety concerns caused by a lack of or failure to sufficient training is an important mission of this thesis. Inadequate training provided by airline companies will be examined as a boundary condition in the relationship between EI and safety performance.

Integrating previous discussions, it is important to acknowledge that the links among pilots' emotions, situational awareness, and safety performance may undergo variations across different stages of their career development. This variability can be attributed to the changes in their values, workplace experiences, and life experiences as they progress along the journey. From the surface, it might seem reasonable that mature pilots, in comparison to those in their early career stage, could potentially exhibit higher-level situational awareness, and control their emotions under emergencies due to their conditioned reflex-forming with the accumulation of experiences. However, such assumptions may not be legitimately extended to the connections between emotions and awareness of situational and safety-related factors. Existing literature appears to have not yet offered conclusive evidence on this specific topic. Taken together, there is value in investigating how the relationships between emotional competencies, such as emotional intelligence, situational awareness, and safety outcomes, may differ across various stages of a pilot's career path, both before and after joining a company. This research can shed light on critical areas for improvement. The findings and insights generated through this study have the potential to offer valuable guidance to fleet managers and stakeholders. The recommendations may thus encompass practical strategies aimed at enhancing pilots' safety performance, ultimately contributing to the reduction of incidents/accidents and the preservation of lives. By gaining a deeper understanding of how emotional competencies influence situational awareness and safety outcomes, managers can make informed decisions to foster a safer and more efficient operational environment.

Research Aim

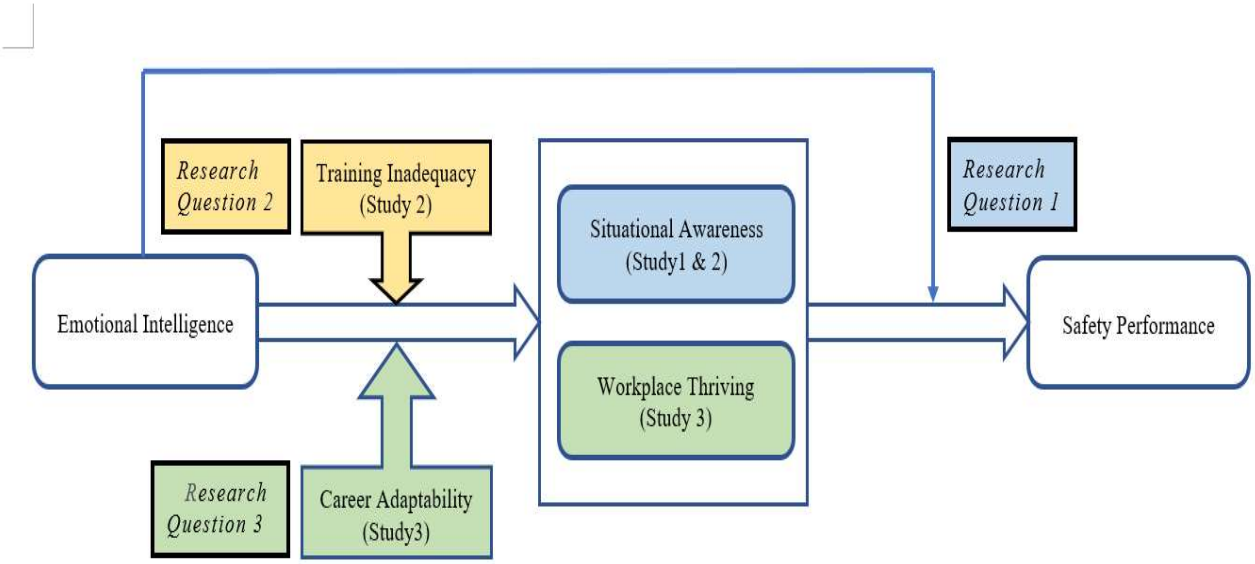
In brief, the proposed PhD research aims to address the previously-identified research gaps by exploring EI as an antecedent of safety performance among commercial aviation pilots. This research seeks to shine a spotlight on the complex interconnections between emotional intelligence (EI), situational awareness, safety performance, career adaptability, and thriving within the aviation sector. It will explore the career development and workplace safety literatures to identify new factors influencing employees' vocational states psychologically, particularly for those within professions characterised by limited career mobility, such as commercial pilots. It is expected that the research findings can be applied to other professions with similar constraints on career mobility. Furthermore, the knowledge generated from this research is anticipated to provide practical guidance to organisations endeavouring to enhancing their safety management systems, fostering a safer working environment for their employees. Ultimately, this research aims to contribute to the broader field of safety management and career development, with the potential to positively influence safety outcomes and the overall thriving of individuals within the workforce.

Research Model

The proposed research model is shown in Figure 1.5. In the following Chapters 4, 5 and 6, this research model will be presented with different line types and colours to highlight the unique aspects of the research model, which will provide a roadmap to the studies and research questions.

Figure 1.5

Overview of the Empirical Studies



Notes: Study 1: Relationships between EI, situational awareness, and safety performance. Study 2: Moderation of training inadequacy on the mediating relationship between EI and safety performance via situational awareness. Study 3: Moderation of career adaptability on the mediating relationship between EI and safety performance through thriving.

This research primarily employed a quantitative research approach to collect and analyse data. Both paper questionnaires and online surveys were utilised to collect data. A two-time wave survey methodology was implemented to collect data at two distinct points in time with approximately one month between the waves. The study participants were recruited from two distinct groups: full-time pilot trainees in flight training colleges, and full-time pilots working in commercial airline companies in mainland China. The sample of pilot trainees was used to examine the relationship between EI and safety performance via the mediating factor of situational awareness, addressing Research Question 1. The results and findings are presented in Chapter 4. Subsequently, the second set of samples comprising full-time pilots was employed for Studies 2 and 3, which were designed to address Research Questions 2 and

3 separately. The detailed findings and results of these studies are presented in Chapters 5 and 6. Employing a combination of data collection methods and ensuring a time gap between the data collection waves helps to minimise the potential effects of the common methods bias and enhance the validity of our findings.

Research Questions

While the correlation between EI and work performance has been extensively documented in prior research (Daus & Ashkanasy, 2005; Lopes et al., 2006; Miao et al., 2021; Wong & Law, 2002), there remains a research gap in the empirical exploration of the underlying mechanisms that facilitate this association. Specifically, the psychological processes through which EI exerts a positive influence on employees' work performance have not been adequately investigated. Enhancing our comprehension of this complex process holds the potential to assist employers in developing effective strategies to improve employees' work performance.

This proposed research will focus on the safety aspects of work performance and attempt to explore the mechanism for the relationship between EI and safety performance. More specifically, the proposed research will examine the relationship among commercial pilots' EI, situational awareness, and safety performance by integrating psychological states in career development. The intentions of this project are to advance previous theories of EI and work performance, and to provide practical guidelines for pilots' training and career development. More specifically, this research responds to the research questions listed below following an explanation.

The first research question is the main thread of this thesis and focuses on the mechanism through which EI can influence safety performance. The second and third research questions examine the conditions under which the effects of EI on safety performance will be stronger or weaker. These conditions are related to variables that are

determined from the literature as being relevant and important to career development processes: thriving and career adaptability. These three research questions will be explored in three separate analyses resulting in three papers that will form the core elements of the thesis. While informed by pertinent research, anecdotal and untested observations from my experiences have shaped these questions. My daily interaction with pilots in China, has made me recognise the importance of the pilots managing their emotions in facilitating their appropriate reactions to different expected and unexpected situations to ensure a safe flight (Jiao et al., 2022). I am also aware that this career group in China may have been experiencing some serious career issues (e.g., thriving, less career mobility) even though they can achieve relatively high social status and a high salary(Shi, 2022; Xu et al., 2024).

Specifically, the research questions are as follows:

Research Question 1: How does EI affect the safety performance of Chinese commercial aviation pilots? Through what mechanisms does EI influence safety performance?

Study 1 (Chapter 3): The main thread of this thesis examines the relationship between EI (considered across four EI dimensions: self-emotion appraisal; others' emotion appraisal; regulation of emotion; and use of emotion) and safety performance (captured by two dimensions: safety participation and safety compliance) and examines the mediating role of situational awareness between the two.

Research Question 2: How does the training provided by airline companies influence the relationship between EI and safety performance?

Study 2 (Chapter 4): This study explores the moderating role of training inadequacy on the relationship between EI and safety performance and the mediating role of situational awareness as a mechanism underlying this relationship (i.e., in the indirect relationship between EI and safety performance via situational awareness).

Research Question 3: How does pilots' career adaptability influence the relationship between EI and safety performance via thriving?

Study 3 (Chapter 5): This study explores the moderating role of career adaptability in the relationship between EI and safety performance as well as the mediating role of thriving as a mechanism underlying this relationship (i.e., in the indirect relationship between EI and safety performance via thriving).

Thesis Structure

This current thesis aims to investigate the influence of EI on pilots' safety performance, and the following outlines the structure.

Chapter 1 gives an introductory overarching view of safety and background for the study. It outlines the motivation behind the research and presents the research objectives.

Chapter 2 is the literature review and provides a detailed review of the major concepts and their respective theories and developments. Within this chapter, an in-depth overview is conducted on the two key concepts: namely, emotional intelligence and safety performance. Then, a brief overview of the mediator (i.e., situational awareness and thriving) and the moderators (training inadequacy and career adaptability) is presented.

Chapter 3 offers an insight into the research methodology applied in this thesis, which focuses on examining the impact of EI on pilots' safety performance. This chapter elaborates on how this study was conducted, including the research model design, the selection of the target group, methods of data collection, and the analysis procedures.

Chapter 4 presents the results of Study 1, introducing EI as a predictor of individuals' safety performance in the workplace. This chapter tested the relationship between EI, situational awareness, and safety performance and in so doing, enriched the comprehension of the factors shaping safety-related behaviour in the workplace.

Chapter 5 presents the results of Study 2. Based on the results of Study 1, this study examined the role of safety training adequacy as a situational cue that triggers individuals' EI and propels their safety-related cognitive processes and actions.

Chapter 6 presents the results of Study 3. This study examined a moderating mediation framework, which involves the mediating role of employee thriving and the moderating role of career adaptability in the relationship between EI and safety performance.

Chapter 7 summarises the primary findings stemming from three empirical studies presented in Chapters 4, 5, and 6. Additionally, it addresses the existing limitations and offers recommendations for future research.

Table 1.1

Thesis Structure and Chapter Overview

Chapter 1	Introduction
Chapter 2	Literature Review
Chapter 3	Methods
Chapter 4	Emotional Intelligence and Safety Performance at Work: A Moderated Mediation Model of Situational Awareness (Study 1)
Chapter 5	Linking emotional intelligence to safety performance: The roles of situational awareness and safety training (Study 2)
Chapter 6	Why and when do emotionally intelligent employees perform safely? The roles of thriving at work and career adaptability (Study 3)
Chapter 7	General Discussion

Chapter 2

Literature Review

This chapter reviews the key variables and their associated theories. Specifically, this chapter firstly provides a detailed review of the two concepts that form the major research streamline of this thesis: namely, emotional intelligence (EI) and safety performance. Then it presents a brief overview of the mediator variables (situational awareness and thriving) and the moderator variables (namely, training inadequacy and career adaptability); these elements will be examined more fully in the empirical sections of this thesis. To reduce repetition, this section will not focus on the theoretical backgrounds of separate studies. Instead, a more detailed literature review and hypothesis development about the relationships among these six concepts will be presented in the empirical chapters of this thesis: specifically, Chapters 4, 5, and 6.

Theoretical Framework

This thesis is grounded in three main theoretical frameworks. Firstly, the EI theory posits that the ability to manage emotions has a positive influence on various aspects of individuals' lives and work performance (Mayer et al., 2004). This theory suggests that individuals with high EI are adept at managing their own emotions and those of others, leading to positive interpersonal relationships and improved work performance. Furthermore, EI fosters emotional stability, which is crucial for maintaining good mental health and cognitive abilities (Cote & Miners, 2006) . Furthermore, EI fosters emotional stability, which is crucial for maintaining good mental health and cognitive abilities (Côté, 2014), ultimately resulting in enhancing work performance (Zhu et al., 2022).

Secondly, the Socially Embedded Model of Thriving (SEMT) provides a useful framework for measuring individuals' growth in the workplace by incorporating two indicators: learning and vitality (Spreitzer et al., 2004). According to this theory, thriving is not solely an individual pursuit but is deeply embedded within social and organisational contexts. The theory emphasises the reciprocal relationship between individuals and their contexts. Individuals' thriving is influenced by the social and organisational factors that surround them, while at the

same time, individuals' thriving contributes to shaping and transforming these social and organisational contexts.

In the context of the study, the SEMT theory can provide a framework for understanding how EI influences thriving among commercial pilots. By examining the interplay between EI, thriving, and safety performance within the social and organisational context, the study can shed light on the mechanisms and factors that contribute to pilots' well-being, engagement, and overall thriving in the aviation industry.

Thirdly, trait-activation theory (TAT) (Tett et al., 2021) posits that certain situations or environmental cues can activate specific traits within individuals, influencing their thoughts, emotions, and behaviours. In the context of EI, TAT suggests that certain situational factors can stimulate and enhance the expression and utilisation of EI skills.

TAT proposes that individuals possess stable traits, including emotional intelligence, which can vary in their activation levels depending on the situational context. According to this theory, specific situations can trigger the activation of trait-based cognitive and behavioural patterns. In the case of EI, situational factors can serve as catalysts for individuals to utilise their emotional intelligence skills more effectively.

For example, a work environment characterised by high emotional demands, such as a customer service role, may activate individuals' emotional intelligence. The need to understand and respond appropriately to customers' emotions and concerns can heighten the relevance and application of emotional intelligence skills, such as empathy, emotional regulation, and social awareness. In this example, the situational demands prompt individuals to draw upon their emotional intelligence capacities to navigate social interactions and meet the job requirements effectively.

By incorporating these theoretical frameworks, this thesis aims to provide a comprehensive understanding of the relationship between EI and safety performance in the

workplace. TAT suggests that situational factors play a crucial role in stimulating and enhancing emotional intelligence, thus improving situational awareness. Simultaneously, the Socially Embedded Model of Thriving emphasises the importance of EI in facilitating thriving and prompting performance.

Key Concepts

Emotional Intelligence

What is Emotional Intelligence? And how should it be conceptualised?

The concept of EI was initially defined by Mayer et al., (1990) to explain the variation among individuals in applying mental abilities to process emotion-related information (Mayer & Geher, 1996). The core framework of EI consists of emotions and intelligence; however it is distinct from both as well (Mayer et al., 2008a), but considering its connection to emotion and intelligence may be an effective approach to gaining a comprehensive understanding of EI. Emotions reflects one's reaction upon stimulus and can be observed by a series of changing behaviours, such as facial expression, vocal tone, and body language. Emotions have profound influence on human behaviour, decision-making, and social interactions (Lerner et al., 2015). For example, when one is in a positive emotional state, like feeling happy, they may overestimate their capability, and show an increased willingness to engage in more social and outgoing behaviours (Glomb et al., 2011). How we express and interpret emotions significantly shape the way of thinking, actions, and various aspects of human life (Baumeister et al., 2007). Intelligence can be understood as the ability to acquire, process, and apply knowledge and information to solve problem, make decisions, adapt to new situations, and learn from experience. For instance, verbal intelligence measures one's proficiency in language, including reading, writing, and speaking. It encompasses vocabulary, compression, and the ability to use words to communicate and express ideas. EI research focuses on how people recognise, learn,

reason, and use emotion-related information to enhance rationality, solve problems, and gain personal growth and quality of life.

Since its inception, EI has received considerable attention from both scholars and the general public. In the past few decades, EI has been extensively studied in academia due to its significant role in explaining how students can achieve good results and quality relationships in addition to their IQ and consciousness ability, as well as its relevance in organisational behaviour studies (Bayighomog & Arasli, 2022; Joseph, Jin, Newman, & O'Boyle, 2015; Zeidner et al., 2004). In this section, I will provide an overview regarding the conceptualisation of EI, the popular models of EI, and the measurement of EI.

The Concept of EI

With the popularity of Daniel Goleman's book *Emotional Intelligence: Why It Can Matter More Than IQ* in 1995, scholars and the general population alike were drawn to study EI. A variety of EI theories and measures have since been developed in the late 1990s as there was no consensus on the definition of EI.

The literature has documented two main approaches to conceptualise and study EI – one that mixes personal traits and cognitive ability and another that focuses on ability only. The first one is also known as the mixed approach. Mixed (trait-ability) EI is described as emotional self-efficacy, which is embedded within a personality framework, and incorporates several self-perceived abilities (e.g., social intelligence and personal intelligence) and personality variables (e.g., empathy, assertiveness, and optimism) (Petrides & Furnham, 2000). Ability EI refers to the capacity to intelligently process emotions and emotion-related information, aiding in cognitive processes (Mayer et al., 2016).

Mixed EI (Trait-Ability EI)

Goleman's (1995) EI competence model consists of four dimensions: (1) *Self-awareness* (this involves recognising one's emotions, conducting accurate self-assessments,

and fostering self-confidence); (2) *Self-management* (this encompasses conscientiousness, trustworthiness, adaptability, goal-oriented behaviour, and the ability to regulate emotions and behaviours effectively); (3) *Social awareness* (this entails displaying empathy towards others, demonstrating a service-oriented mindset, and possessing an understanding of organisational dynamics); and (4) *Social skills* (this includes proficiency in leadership, communication, influence, conflict resolution, relationship-building, effective teamwork, and collaboration, as well as the capacity to mentor and guide others) (Boyatzis et al., 2000; MacCann et al., 2020). This model emphasises the competencies regarding an awareness of emotions in self and in others as well as the management of emotions in self and in others (Abraham, 2004). However, the inclusion of a range of desirable personal traits that are not fully captured by cognitive intelligence raised questions about its adequacy in representing the genuine definition of EI. Later, researchers criticised this definition as too broad to discriminate the difference between EI and social cognition (e.g. communication skills) (Cherniss, 2010; Schutte et al., 1998).

Another mixed-trait EI model, developed by Bar-On (1997), refers to EI as "an array of non-cognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures" (p. 17). This model consists of five components: (1) *Intrapersonal skills* (encompasses the ability to recognise and comprehend emotions, feelings, and thoughts within oneself, with subfactors including self-regard, emotional self-awareness, assertiveness, independence, and self-actualization); (2) *Interpersonal skills* (focuses on the awareness and understanding of emotions, feelings, and thoughts in others, divided into empathy, social responsibility, and interpersonal relationship); (3) *Adaptability* (involves adjusting emotional responses based on the situation, with subfactors including reality-testing, flexibility, and problem-solving); (4) *Stress management* (includes the capacity to manage stress and control emotions, consisting of stress tolerance and impulse

control); and (5) *General mood* (relates to the ability to experience and express positive emotions, maintain optimism, and includes subfactors optimism and happiness) (Baron, 2006).

This conceptualisation of EI involves such personal behavioural dispositions as motivation, assertiveness, and self-perceived abilities that may influence emotions, which contribute to improve psychological well-being (Bar-On & Parker, 2000). Some scholars argue that this construct is not inherently distinct from other abilities as it does not clearly distinguish personal traits from abilities (Zeidner et al., 2004). Given these characteristics, Baron (2006) suggests that it is more accurate to define his model as emotional-social intelligence.

Another example of a mixed trait-ability EI model was developed by (Petrides et al., 2007). This model includes four components: well-being, sociability, self-control, and emotionality (Cherniss, 2010). Facets included in this construct are emotion-related personalities that are distinct from the traditional personality domain (Petrides et al., 2007). The authors argue that this type of EI is a low-order construct, which is different from the 'Giant Three' and the 'Big Five' personality models (Petrides et al., 2007). Similar to Goleman's conceptualisation, this definition is overly broad and mixes some unrelated attributes like achievement motivation, adaptability, and self-regard (Joseph & Newman, 2010).

While these models have been applied in previous EI research, their conceptualisations frequently deviate from the core essence of EI — the ability to use emotions to enhance reasoning. Furthermore, there is a notable lack of consensus on a clear definition of what exactly mixed EI represents (Joseph, Jin, Newman, & O'Boyle, 2015). Consequently, mixed EI models may not accurately represent the true nature of EI (Matthews et al., 2004).

Ability EI

It is important to recognise that EI, in essence, is a specific form of intelligence that is emotion-related rather than general cognitive intelligence (Sternberg, 2020). Under this domain, EI is conceptualised as the combination of both intelligence and emotion (Ciarrochi et al., 2000;

Mayer et al., 2008b). While EI is concerned with the linkages and interplay between emotions and intelligence, distinctions do exist (Mayer et al., 2008a). Given the internal composition of EI, a legitimate way to understand EI should fully consider the fundamental elements of both intelligence and emotions (Mayer et al., 2008a).

Ability EI refers to a set of interrelated abilities to reason about emotions accurately and use emotions to enhance thoughts (Mayer et al., 2008a). In this context, ability EI emphasises the ability to manage one's own and other's emotions, as well as utilising emotion-laden information to guide thinking and behaviour. This model, as proposed by Salovey and Grewal (2005), outlines four capability branches of perceiving emotions, assimilating emotion-related feelings, understanding, and managing emotions (Mayer et al., 1999; Mayer et al., 2000). It's crucial to recognise that this conceptualisation of ability EI underlines the cognitive skills associated with the effective use of emotions to achieve good outcomes. Mayer et al. (2004) argue that EI, as a distinct intelligence, can be improved with age and experience, as supported by research evidence that the performance of older or well-educated individuals exceeded their younger or less-educated counterparts in the ability-focused Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)

A valid EI conception should have clear content and be distinct from other constructs (Mayer et al., 2008a). Ability EI was initially defined with three key elements, and it later developed into four hierarchical essential aspects. The early definition, proposed by Salovey and Mayer (1990), characterises EI as "the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and actions" (p. 189).

As research progressed, building upon this perspective, Mayer and his colleagues constructed a conceptual model. This model argues that EI contains four emotion-related processing abilities: perception of emotion; facilitation of emotion; understanding of emotion;

and management of emotion (Mayer & Salovey, 1997b; Mayer et al., 2004). Specifically, this hierarchical four-branch theoretical model elaborates four essential branches of emotion-related skills that range from basic information processing to strategic utilisation of emotional information to achieve personal growth. These four dimensions are: (1) perceiving emotions; (2) using emotions to facilitate thought; (3) understanding emotions; and (4) managing emotions in oneself and others (Mayer et al., 2016).

In summary, there are diverse theoretical frameworks for understanding the EI construct. Mixed or trait-ability EI models include domains of personality as well as the capabilities of perception, assimilation, understanding, and management of emotions (Zeidner et al., 2004). Cherniss (2010) argued that most EI models, regardless of the underlying approach, have adopted a basic construct, defined by Mayer and Salovey (1995), as the ability to perceive, express, assimilate, understand, and regulate emotion in self and others. Thus, the models may not contradict each other, but rather can be identified as different perspectives of EI that complement each other (Joseph & Newman, 2010).

Measurements of EI

Due to the sudden popularity of Emotional Intelligence (EI) with the publication of Goleman's book (1995) Emotional Intelligence: *Why it Can Matter More than IQ*, researchers were focusing on creating their own theoretical model rather than building on an existing theory. The lack of agreement on EI theory, as mentioned earlier, led to two types of measurement approaches: ability scales and rating scales (Mayer et al., 2000). Ability scales require test-takers to show their knowledge or their response upon the processing of emotion-related information. In contrast, rating scales require test-takers to assess their agreement with a set of statements.

Since the 1990s, various measurement instruments for EI have been developed and tested, drawing from different EI models. For example, Salovey et al. (1995) developed a 30-

item Trait Meta-Mood Scale (TMMS) to test EI. This self-report assessment tool is characterised by a three-factor structure and is used to examine three subscales of trait EI including attention to feelings, discrimination of feelings, and regulation of emotions. Later, Mayer et al. (1997) created the Multi-factor Emotional Intelligence Scale (MEIS) to measure their revised mental ability EI model. The MEIS is formulated into four hierarchy branches: perceiving emotions; using emotions to enhance thoughts; understanding emotions; and managing emotions. A more recent version is the Mayer-Salovey-Caruso Emotional Intelligence (MSCEIT) (Mayer, 2002). This instrument, like an IQ test, is a maxim-performance test model in which two scoring systems are employed to assess the answers of test-takers (Mayer et al., 2008). The expert-consensus scoring method and general-consensus scoring method have been shown to correlate well on correct answers (Mayer et al., 2001). MSCEIT consists of 141 test items and is the only commercial ability instrument for measuring EI. Given the expense and the average time commitment of 30-45 minutes required for completion, this approach was not chosen for this research.

Bar-On (1997) introduced a 133-item Bar-On EQ-I scale to test his mixed trait-ability model of EI. The Bar-On model includes a cross-section of interrelated emotional and personality traits, which are subdivided into the five subfactors of intrapersonal skills, interpersonal skills, adaptability, stress management, and general mood (Baron, 2006). The EQ-I instrument is an inventory that includes social, emotional, cognitive, and personality dimensions (Berrocal & Pacheco, 2006). As with many other mixed-trait conceptual frameworks, this scale uses a self-report approach to measure individuals' EI.

Another instrument was developed by Goleman (1995) to assess EI with five essential elements. In the book *Working with Emotional Intelligence*, Goleman updated the scale to examine the outcomes of EI in the workplace (Goleman, 1998). The five-faceted model was later modified by Boyatzis et al. (2000) through reorganising the five factors into four

dimensions, namely: self-awareness; self-management; social awareness; and relationship management (Boyatzis et al., 2000; Goleman, 2001). This instrument, including 20 emotional competencies regarding work performance, is named the Emotional Competences Inventory 2.0 (ECI 2.0) and is based on a 360-degree methodology which has been found to have fair validity and reliability (Boyatzis et al., 2000; Sala, 2002). The ECI 2.0 includes 110 items and comprises two assessment approaches: a self-report measure where individuals self-assess their proficiency in each competency, and an external rating conducted by colleagues or supervisors (Berrocal & Pacheco, 2006).

Wong and Law developed a 16-item Emotional Intelligence Scale (WLEIS) based on the EI theory of Mayer and Salovey (1997b). This self-report measurement is composed of four distinct subscales including self-emotional appraisal (SEA), others' emotion appraisal (OEA), regulation of emotion (ROE), and use of emotion (UOE). This innovative approach integrates trait components into ability EI instruments. Essentially, EI assessed based on WLEIS can be viewed as a self-rated ability. Empirical evidence has shown that this short EI measure (WLEIS) has reasonable reliability (Cronbach's α ranging from 0.83 to 0.90) and validation for empirical research (Iliceto & Fino, 2017; Wong & Law, 2002). Although this measure was first developed in China, its application to other cultural contexts has been widely tested in several countries including Spain (Pacheco et al., 2019), Italy (Iliceto & Fino, 2017), Korea (Fukuda et al., 2012), the USA (LaPalme et al., 2016), Belgium, Singapore, Japan, and Kuwait. Although the WLEIS is a self-report measure, it was specifically designed to assess emotional intelligence as an ability (LaPalme et al., 2016; Pacheco et al., 2019). This measure has been empirically examined by practitioners over 166 times, according to a Google Scholar citation search in 2023, which is even higher than that of MSCEIT, which has been adopted in a total 83 published studies. Although citations in themselves do not necessary reflect the strength of scientific contribution, the frequent citation of this scale suggests widespread acceptance and

use as a self-report instrument. The popularity of this measurement indicates its practicality and ease of use in research settings. Considering the WLEIS' solid foundation in ability EI theory, its concise 16-item scale, and its convenient self-report format, this makes it a preferred choice for this research.

Given the ongoing debate about whether EI is better defined as an ability or a personality trait, the assessment methods of EI are accordingly classified into two main as approaches: performance-based tests and self-report assessments (Goldenberg et al., 2006). These measurements have been paired to examine different types of EI models. Specifically, trait EI, concerning self-perceived capacities and emotional-related traits, is evaluated through self-report measures. Conversely, ability EI, concerning emotional-related information processing capabilities, is assessed via maximum-performance tests (Petrides et al., 2007). It is important to note that employing a specific measure for EI does not imply aligning with a particular conceptual model of EI. In practice, this means that researchers may acknowledge and support the ability-based theory of EI, yet they might employ measurement tools originally developed for the trait EI model in their studies (Kotsou et al., 2019). Such disconnect between measurement and underlying conceptual models leads to potential inconsistencies and issues of clarity in EI research methodology and findings (O'Connor et al., 2019; Zeidner et al., 2004). Therefore, further understanding and clear acknowledgement of the implications associated with each conceptual model and measurement choice are necessary for advancing EI research.

EI in the Proposed Research

Zeidner et al's (2004) systematic review asserted that the definition of ability EI by Mayer and Salovey (1997b) is most scientifically recognised within the domain of EI research. Accordingly, the proposed research will follow Mayer and Salovey's (1997b) definition of EI as consisting of hierarchical integrative abilities related to managing one's emotions, or "the ability to perceive accurately, appraise, and express emotion; the ability to access and/or

generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth" (Mayer & Salovey, 1997b, p. 10). As discussed earlier, in line with this definition, this EI model consists of four dimensions that reflect four distinctive emotional abilities (perception and understanding of emotions, facilitation of emotions, understanding and management of emotions, and utilisation of emotions in social interactions) (Mayer & Salovey, 1997a).

In this thesis, ability EI is considered as a significant factor influencing individuals' performance in the workplace. Numerous studies have demonstrated that ability EI is a useful predictor of work performance in a range of situations (MacCann et al., 2020). These studies have consistently revealed that individuals with higher levels of ability EI tend to exhibit better work performance outcomes such as task performance, teamwork, leadership effectiveness, and job satisfaction (Kotsou et al., 2019). Furthermore, such individuals are more likely to effectively manage their emotions and adapt to dynamic work environments. This heightened emotional self-awareness allows them to understand their own strengths and weaknesses, enabling them to make better decisions, handle stressful situations, and cope with work-related challenges more effectively (Kotsou et al., 2019; Millán et al., 2011). It is worth noting that the predictive power of ability EI on work performance extends beyond traditional cognitive abilities and personality traits. While cognitive abilities are crucial for task performance, ability EI provides an additional layer of understanding and prediction regarding how individuals manage their emotions, navigate social dynamics, and adapt to work-related challenges (Agnoli et al., 2012; Qualter et al., 2012). The focus is on ability rather than trait EI because the predictive function of ability EI (as compared to trait EI) on work performance is less likely to be contaminated by the intervening effects of other predictors such as personality traits and self-efficacy (Farh et al., 2012; Lopes et al., 2006). In their meta-analytic study, Joseph, Jin, Newman and O'Boyle (2015) argued that the strong

correlation between trait EI and work performance is due to the fact that the content of mixed/trait EI measures overlap with a set of well-known psychological constructs, including self-efficacy and self-rated performance (See also Conte, 2005; Mayer et al., 2008). This overlap suggests that what is often measured and interpreted as trait EI may, in fact, encompass aspects of these well-documented constructs. That is, mixed EI umbrellas a variety of constructs that have well-established positive relations with job performance, which explains why mixed EI effectively predicts work performance. For instance, Joseph and Newman (2010) found that the claimed influence of mixed EI measures on work performance actually was captured by self-efficacy and self-assessments. The same results were verified in a meta-analytic study (Joseph, Jin, Newman, & O'Boyle, 2015), indicating that the impact of mixed EI on work performance reduced from a positive effect ($\beta = .29$) to a negligible effect ($\beta = -.02$, ns). This change demonstrated that there is no incremental validity when controlling the previously-mentioned personal factors. In short, because of the current dispute regarding the roles of trait EI, the proposed research will focus on the impact of ability EI on safety performance, which is a special work performance domain.

Given the theoretical focus on ability EI in this study, after comparing the implementation cost of the aforementioned EI measurements, the Wong and Law's (2004) emotional intelligence scale was therefore chosen as the most appropriate instrument tool for this study. The WLEIS scale, developed on Mayer et al. (2016) ability theory, consists of 16 items. This scale fully captures the four dimensions of EI: self-emotional appraisal (SEA), other's emotional appraisal (OEA), regulation of emotion (ROE), and use of emotion (UOE). Furthermore, the WLEIS's self-report format provides a flexible method to administrate and collect data in large-scale studies. Last, this scale has been examined across cultural contexts and has proved reliability and validity in measuring ability EI.

Safety Performance

Individuals are exposed to a variety of safety issues in the workplace every day. Previous research has demonstrated that an individual's safety behaviour has a significant impact on his or her accident involvement (Clarke & Robertson, 2005; Kalteh et al., 2021; Neal & Griffin, 2006). Unsafe behaviours may cause serious consequences, such as economic loss, physical injuries, or even fatalities. Based on global statistics, the estimated economic loss from negative safety-related outcomes is approximately 4-5% of a country 's gross domestic product (GDP) (Takala et al., 2014). Unsafe behaviour can also produce negative consequences for the organisation. For example, work-related accidents may cause increases in medical treatment spending, delays in project completion, and damage to an organisation's reputation. Given these potential consequences, it is critical to understand the factors influencing employees' safety performance behaviour (Hansez & Chmiel, 2010). This section will provide an overview regarding the conceptualisation of safety performance, the major models of safety performance, and the measurements of safety performance.

The Concept of Safety Performance

In workplace safety literature, the term safety performance is used to describe two concepts that focus on different levels. At the organisational level, safety performance is used as an indicator measuring the safety outcomes of an organisation. For example, accident statistics such as Accident Rate (AR), Incident Rate (IR), or Experience Modification Rating (EMR) are used as the criterion to assess the safety performance of the organisation (Kalteh et al., 2021). A company with a lower rate of accidents is usually viewed as having higher-level safety performance compared to one with a higher accident rate. At the individual level, safety performance refers to how well individuals perform safety-related behaviours (Burke et al., 2002; Christian et al., 2009). For example, when workers breach procedures and rules, their performance can be labelled as unsafe or as examples of safety violations.

As this thesis focuses on individuals' safety performance, this section of the literature review investigates individual-level psychosocial and behavioural processes only. This focus is also driven by several theoretical bases. First, although most individuals' safety violation behaviours are interrelated with the safety outcomes of organisations, Christian et al. (2009) argue it is important to distinguish the safety-related performance of the individual from that of the organisation as they may have different antecedents. Organisation-level safety performance may not be able to capture individual-level processes and situations, which are essential to understand the factors that drive the employee, as an individual, to perform safely at work. In support of this view, Zohar (2000) points out that the number of unsafe incidents in organisations are often small and scattered, therefore its prediction of safety performance at the individual level tends to be weak and ambiguous. Second, studying individual safety behaviours helps clarify the links between individual performance and organisationally-relevant outcomes (Neal & Griffin, 1999; Syed-Yahya et al., 2022). Third, although there is a close interrelation between the general definition of safety performance at the company level and the narrower one at the individual level, the influence of individuals' safety behaviour is more directly and strongly linked to accident involvement, relative to the effects of the organisation level (Neal & Griffin, 2006).

In this thesis safety performance is operationalised as individual-level behaviours that indicate how well one performs to contribute to workplace safety. This conceptualisation is consistent with the prevailing views in safety literature. Scholars in this field advocate for the construction of individuals' behaviour as a more precise measure of safety performance, rather than using safety outcomes as safety performance indicators (Arzahan et al., 2022; Christian et al., 2009). This approach is reflected by recent research that uses individuals' routine violation behaviours as an analogy for lower safety performance (Hansez & Chmiel, 2010; Zhou et al., 2024). Specifically, the proposed research will be guided by the framework developed by

Griffin and Neal (2000), with a specific focus on the individual safety behaviours. Safety performance, in this context, comprises of a range of employee work behaviours that directly contribute to workplace safety. These activities include following work procedures, wearing personal protective equipment, and more indirect behaviours such as actively participating in safety meetings (Griffin & Neal, 2000).

Griffin and Neal (2000) proposed that safety performance, as individuals' behaviours in the workplace, can be measured using a similar approach to that used in work performance scales, which involve behaviours that shape one's work performance. Griffin and Neal's (2000) conceptualisation draws on the theory of work performance developed by Campbell et al. (1993) and Borman and Motowidlo (1993). According to Campbell et al. (1993), work performance is reflected in their behaviours, which means their real actions can be observed and assessed in the form of their proficiency or contribution. More specifically, their theory of performance conceptualises a taxonomy of eight major components including job-specific task proficiency, non-job-specific task proficiency, written and verbal communication, effort demonstration, committing to personal discipline, maintenance of peer and team performance, management/administration, and supervision/leadership. These performance subsets, proposed by Campbell et al. (1993), theoretically fit (to a large extent) into the categories of task performance and contextual performance, which are distinguished in an alternative work performance model developed by Borman and Motowidlo (1993). In this model, task performance refers to the core behaviours involved in a given task, and contextual performance refers to the non-core activities which contribute to supporting the work environment.

Consistent with the framework proposed by Borman and Motowidlo (1993), Griffin and Neal (2000) developed a two-dimensional model of safety performance, which has been predominantly employed in the current workplace safety literature. This model consists of two distinct aspects, safety compliance and safety participation, which stem from the

conceptualisation of task performance and contextual performance (Clarke & Robertson, 2005). Safety compliance refers to the core safety-centred activities that individuals are required to perform in a safe manner to ensure workplace safety (Neal & Griffin, 2006). For example, workers in construction companies should implement construction activities exactly following the company's safety principle and rules, and should wear personal protection equipment (Griffin & Hu, 2013). Safety participation refers to individual's voluntary behaviours which contribute to support workplace safety, such as participating in safety meetings and offering safety-related suggestions (Griffin & Neal, 2000). It is worth noting that, as per Google Scholar, this model has been cited over 631 times in 2003. This significant citation count demonstrates its impact and recognition in the academic community. Neal and Griffin's (2006) subsequent paper, which utilises the safety performance model to investigate the relationships among safety climate, safety motivation, safety behaviour, and accidents, has also gained significant academic attention. Since its publication in 2006, it has been cited over 2,234 times, reflecting its extensive influence and recognition in safety-related research. In line with the earlier definition of safety performance, this thesis will use Griffin and Neal's two-dimensional model to analyse safety performance in terms of safety compliance and safety participation.

Determinants of Safety Performance

Campbell et al. (1993) proposed that an individual's work performance is primarily influenced by their knowledge, skills/ability, and motivational levels. Griffin and Neal (2000) extended this view to the context of safety performance by suggesting that the contributing factors should also be determined by individuals' knowledge and skills related to safety behaviours well as by their motivation to conduct these behaviours.

Researchers have investigated a range of individual and organisational factors that predict safety performance. A considerable number of empirical studies indicate a strong link between personal characteristics and safety performance (Clarke & Robertson, 2005; Hogan &

Foster, 2013; Zhang et al., 2021). Such individual factors include personality (Hogan & Foster, 2013; Neal & Griffin, 2006), emotion-related variables (N. Li et al., 2021), and other personal attributes (Man et al., 2021). For example, Hogan and Foster (2013) demonstrated that multiple personality facets, derived from the 'Five-Factor' personality model, are related to the individuals' overall safety performance. These personality dimensions included compliance confidence, emotional stability, vigilance, caution, and trainability. In addition, studies show that individuals with high-level emotion management skills tend to achieve higher scores on safety performance (Wiegand, 2007).

Organisational factors, as evidenced in the literature, can be leadership (Ali et al., 2020; Fernández-Muñiz et al., 2014), job demands (Hansez & Chmiel, 2010), job resources, social support, and the organisational safety climate (Neal & Griffin, 2002). While this thesis will primarily focus on individual factors such as emotional intelligence and situational awareness, which are elaborated in other sections (i.e., Chapters 4 and 5), it remains important to review some of these organisational predictors of safety performance. Understanding these factors provides a comprehensive background in identifying potential control variables that might be necessary for the data analysis phase. A well-studied antecedent of safety behaviour or safety performance is safety climate, which has been widely considered an organisational factor influencing safety performance (Clarke, 2006). Safety climate, initially defined by (Zohar, 1980), refers to an individual's perception of policies, procedures, and practices related to safety in the workplace (Zohar, 2000). These perceptions serve as a work reference for employees to guide their adaptive work behaviours. Safety climate thus has a positive relationship with individuals' safety outcomes (Asad et al., 2022; Barbaranelli et al., 2015; Griffin & Curcuruto, 2016) as numerous studies have found that positive perceptions of the safety climate can lead to enhanced safety behaviour and a reduction in unsafe outcomes (Bamel et al., 2020; Griffin & Neal, 2000; Hofmann & Stetzer, 1996). For example, Clarke

(2006); Hofmann and Stetzer (1998) have demonstrated that a positive safety climate encourages individuals to better adhere to safety behaviour which, in turn, improves overall organisational safety. In a longitudinal study, Neal and Griffin (2006) reported that organisational safety climate had a significant lagged impact on individual safety performance. This research, conducted over a five-year period in an Australian hospital, involved surveys of participants at three distinct time points. The study measured variables such as safety climate, safety motivation, and safety performance, which included aspects of safety compliance and safety participation. It was observed that the safety climate exerted a direct delayed effect on individuals' safety motivation. And safety motivation had a similar lagged impact on the safety performance of individuals. The results provided strong evidence that improving safety climate within an organisation is crucial for motivating employees to engage in safe behaviours. Later, their findings were further supported by research verifying the causal relations between safety climate and safety behaviours, showing that individuals who work in an organisation with a positive safety climate were more motivated to engage in safety behaviours (Bensonch et al., 2022). This line of research is highly consistent with the reflection by Zohar (2010) on three decades' of safety climate research, which suggests that safety climate is a robust predictor of safety outcomes including safety performance across industries and countries.

Another important concept related to the context of organizational safety is safety culture. Safety culture refers to "shared values and beliefs that interact with an organisation's structures and control systems to produce behavioural norms" (Cooper, 2000, p. 113). As a sub-part of organizational culture, safety culture is relatively stable and evolves overtime, emphasizing how safety is prioritized, practiced, and enforced within the organization. In contrast, safety climate is more superficial, reflecting the direct perceptions and attitudes of employees regarding safety in the workplace. Unlike safety culture's enduring nature, safety climate can change relatively quickly in response to specific events or changes and is typically

measurable through surveys and assessments. While this thesis focuses on proximal factors that affect safety performance, the related terms, such as safety culture is recognised as relevant. Safety climate conceptualisation holds more relevance for the study. Hence the former terms were reviewed in this section.

In the field of organisational behaviour, research evidence has established the link between work characteristics (e.g., job demands, task complexity) and employee safety performance (Lee et al., 2020; Turner et al., 2012). In particular, job demands and job resources have been identified as critical predictors affecting individuals' occupational well-being (D. M. Andrei et al., 2020; Bakker & Demerouti, 2007) and work performance (Bakker et al., 2004; Sorensen et al., 2021). Job demands refer to a range of aspects including physical, psychological, social or organisational requirements that require certain effort and cost to fulfill the job tasks (Mauno et al., 2007). Examples include high work pressure, role overload, emotional demands, and poor work environment. In contrast, job resources refer to various aspects including physical, psychological, social, or organisational features that help to achieve work goals, reduce job demands, and stimulate personal growth (Bakker et al., 2003). For example, feedback, social support, safety systems, and skill variety are all job resources that can be considered (Falco et al., 2021; Mauno et al., 2007).

Contemporary studies suggest that working under high or overloaded job demands, including physical and psychological demands, will deplete individuals' work performance, exhaust their emotions, and eventually lead to unsafe work behaviours. Crowe's (2020) empirical study has indicated that elevated work demands can significantly burn out individuals' physical and mental energy, lead to emotional burnout, and disengage individuals from safety compliance (Nahrgang et al., 2011). Meanwhile, numerous studies have consistently shown that job resources have positive relationships with increased work engagement, organisational commitment, and enhanced work performance. For example, when many resources are

available, individuals are more engaged in their jobs, committed to their organisations, and motivated to invest efforts for better work performance. Given that these work outcomes reflect the employees' willingness to participate in constructive behaviours that benefit the organisation, it is theoretically plausible that appropriate job resources can promote employees' safety behaviours. Indeed, several empirical studies have supported the positive impacts of job resources on safety outcomes at the individual level (Nahrgang et al., 2011; Yap & Lee, 2020).

Safety Performance Measurement Instrument

With the introduction of the safety performance construct, Griffin and Neal (2000) developed a 7-item scale to measure two distinct aspects of safety performance. Specifically, the scale includes four items designed to access safety compliance and three items to evaluate safety participation (Griffin & Hu, 2013). This self-report instrument has been widely applied in high-risk industries such as healthcare (Arzahan et al., 2022), mining (Ochoa Pacheco et al., 2023), construction (Xia et al., 2023), maritime (D. Andrei et al., 2020), and manufacturing (Xia et al., 2018). While there is considerable research on safety performance in the aviation industry, however, the specific application of the concepts of Neal and Griffin's (2002) and safety compliance and safety participation within the framework I am studying is less extensively explored. In this thesis, I will utilise this approach to examine pilots' safety performance.

Situational Awareness

Situational awareness, also referred to as situation awareness (Stanton et al., 2001), is a very important safety concept in high-risk industries such as construction, oil and gas exploration, nuclear power, and aviation. Situational awareness has been widely studied in aviation due to its critical role in predicting human performance and its significant value explaining human error (Mohammadfam et al., 2021; Van Winsen et al., 2015). Aircraft operations involve working in a rapidly changing environment where pilots must continuously

monitor and interpret a vast amount of information including weather conditions, aircraft performance data, and air traffic control communications. To ensure the safety and course of flight, pilots must make quick, accurate decisions based on their real-time understanding of the situation and take appreciate actions to keep the aircraft on the correct path. By maintaining high situational awareness, pilots can identify and mitigate risks early thereby reducing the likelihood of errors that could lead to critical situations. In contrast, poor situational awareness, or a loss of situational awareness, in a complex workplace is frequently identified as a primary cause of unsafe outcomes (Du et al., 2020; Salmon et al., 2016). This is particularly evident in aviation, where incorrect decisions resulting from compromising situational awareness has been cited as one of the main contributory factors of aircraft incidents or accidents (Endsley, 1999a; Kharoufah et al., 2018; Stanton et al., 2001). In emergency situations, having a strong situational awareness enables pilots to quickly assess the problem, understand the implications for the flight, and adapt their strategy accordingly (Endsley, 2021).

The Concept of Situational Awareness

In the aviation industry, situational awareness is a critical competency for pilots (Endsley, 1995c, 2015b) and refers to "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Endsley, 1995a, p. 66). Endsley (1999) states that situation awareness forms the basis of decision-making and performance. Reports show that situational awareness is a major factor that contributes to pilots' errors and mistakes and affects the outcomes of the flights (Bolstad et al., 2010). This is in line with the argument that the levels of situational awareness can affect pilots' judgments and responses to unexpected scenarios, and thereby impact safety performance (Endsley, 1999a; Salvendy, 2012). Extensive research has shown the causal relation between poor situational awareness and unsafe behaviours. For example, Xu et al. (2021) acknowledge that insufficient situational awareness leads to unsafe acts of air

traffic controllers in Chinese context. In their study, it was found that a lack of sufficient situational awareness led to air traffic controllers forgetting or omitting certain control orders, procedures, and experiencing lapses in control execution. Thus, it is critical to keep a high level of situational awareness during the pilots' processes of performing tasks that may raise safety issues (King & Blickensderfer, 2023; Paul et al., 2020; Shappell & Wiegmann, 2000). For example, during a flight, a pilot inadvertently enters the wrong altitude settings in the aircraft's autopilot system, resulting in a gradual descent. The pilot fails to notice the decreasing altitude until air traffic control alerts them to the dangerously low altitude. This lack of situational awareness led to a potentially hazardous situation that required immediate corrective action.

It was found that an individual might lower or lose situational awareness if they could not distribute attention or manage his or her own emotions properly when facing stress, which is a type of psychological sate frequently experienced by pilots during flying (Endsley, 1999b). Previous evidence has also shown that EI assists in dealing with task-induced stress and helps with decision-making under pressure (Matthews et al., 2006; Sadovyy et al., 2021; Udayar et al., 2020). The evidence given earlier suggests the potential role of EI in the development of situational awareness. Although prior studies have directly or indirectly shown that EI is potentially predictive of situational awareness and situational awareness tends to influence safety performance, no research has explicitly examined whether the EI-safety performance relationship can be mediated by situational awareness. In this thesis, I will incorporate situational awareness in the research model as a mediator in the EI-safety performance relationship, so as to explore the mechanism underlying this relationship.

Theories of Situational Awareness (SA)

Situational Awareness (SA) is a critical concept in understanding how individuals interact with complex systems, particularly in safety-critical environments. In the following

section, I will briefly discuss the three key theories on SA, each of which contributes valuable insights.

Endsley's Three-Level Model (1988)

Endsley's (1995b) three-level model is one of the most widely recognized frameworks for understanding Situational Awareness (SA), particularly in dynamic systems like aviation. This model breaks down SA into three hierarchical levels: perception, comprehension, and projection. The first level, perception, involves recognizing the elements in the environment, such as signals from instruments or changes in surroundings. The second level, comprehension, is where the perceived information is integrated and understood within the context of the task, CFA was used allowing the individual to form a coherent picture of the current situation. Finally, projection is the highest level, where individuals use their understanding of the current situation to anticipate future events or states, enabling proactive decision-making. This model, initially developed in aviation, has been widely applied in nuclear plant, oil & mining, air traffic control, and other high-stakes and stressful environments, where it guides the design of systems and training programs to enhance the SA of operators and improve safety outcome (Hunter et al., 2020). Endsley's (1995b) model offers a clear structure for assessing different degrees of SA and guiding the collection of relevant data during research.

Bedny and Meister's Interactive Sub-Systems Approach (1999)

The interactive sub-systems approach proposed by Bedny and Meister (1999) provides a more complex view of SA by focusing on the cognitive processes. Unlike Endsley's model, which emphasizes the product of SA (i.e., the awareness itself), this approach focuses the cognitive functions and processes involved in achieving SA. It posits that SA emerges from the interaction of various cognitive subsystems, such as memory, perception, and decision-making, each playing a specific role depending on the task and goals at hand. This model is highly dynamic, considering SA as part of an ongoing reflective activity that is continuously

shaped by new information and experiences. The interactive sub-systems approach is particularly valuable for understanding the internal cognitive mechanisms that contribute to SA, making it useful in designing training programs and interventions aimed at enhancing SA in complex, real-world scenarios (Stanton et al., 2001).

Smith and Hancock's Perceptual Cycle Model (1995)

Smith and Hancock's (1995) perceptual cycle model provides a distinct perspective by viewing SA as a product of the ongoing interaction between an individual and their environment. This model is based on Neisser's (1977) perceptual cycle theory, which describes how humans continuously sample their environment, interpret the information, and update their mental models accordingly. In this context, SA is not a static state but a dynamic process that evolves as individuals engage with their surroundings. The perceptual cycle emphasizes the importance of real-time information processing and adaptability, suggesting that SA is deeply context-dependent and shaped by the environment's demands. This approach is particularly useful for understanding how SA can fluctuate in response to changes in the environment and how it can be maintained through continuous monitoring and adjustment of one's understanding of the situation. For example, this approach has been used to understand and improve situational awareness in smart grid systems, where the model's focus on cognitive subsystems helps to enhance operator decision-making in complex environments (Wang & Zhang, 2019).

Measuring Situational Awareness

Measuring situational awareness accurately is essential for understanding how well individuals can perceive, comprehend, and project the elements of their environment. In a review of Situational Awareness (SA) measurement techniques, Endsley (1995a) outlined a variety of methods that have been utilised in practical research, including physiological measurements such as eye-tracking devices and electroencephalograms, performance

measures like external and embedded task performance metrics, subjective rating techniques encompassing self and observer ratings, questionnaires (both post-trial and online), and freeze probe techniques (e.g., SAGAT, see below). A review by Stanton et al. (2006) categorised SA assessment methods into several groups: freeze probe techniques, real-time probe techniques, post-trial subjective ratings, observer ratings, process indices, and performance metrics. I will briefly summarise each of these measurement approaches below.

Freeze Probe Techniques

Freeze probe techniques in SA assessment involve pausing a task simulation at random intervals, during which all visual displays are obscured, and participants are presented with a series of SA-related questions about the situation just before the pause. These queries require participants to respond based on their understanding and knowledge of the situation at the moment of interruption. The accuracy of their responses is then evaluated against the actual state of the system at the time of the freeze. This process allows for the calculation of an overall SA score at the end of the trial test. The Situational Awareness Global Assessment Technique (SAGAT), developed by Endsley (1995a), is a widely-used method for objectively measuring situational awareness. It is specifically designed to assess pilots' SA. SAGAT assesses all three levels of situational awareness — perception, comprehension, and projection — providing a comprehensive snapshot of the individual's situational awareness at specific points in time.

Real-Time Probe Techniques

Real-time probe techniques for SA assessment involve posing SA-related questions to participants during their task performance, without interrupting or freezing the task. Subject Matter Experts (SMEs) typically prepare these queries either before or during the task execution. The queries are then administered while the participant is engaged in the task. Both the content of the answers and the time taken to respond are used to assess the

participant's SA. A significant benefit of real-time probe techniques is their minimal intrusiveness, as they do not require pausing the task, unlike freeze probe techniques.

A popular real-time probe approach is the Situation Present Assessment Method (SPAM) developed by Durso et al. (1999), initially designed to evaluate air traffic controllers' SA. In SPAM, operators are probed with task-related questions (e.g., "Which of the two aircraft, A or B, has the higher altitude?"), typically via telephone. The time taken to respond correctly to these queries serves as a measure of the operator's SA, while the duration taken to answer the telephone is considered an indicator of workload.

Self-Rating Techniques

Self-rating techniques are employed to gather participants' subjective assessments of their SA. These techniques, typically administered post-trial, require participants to rate their perceived SA using a specific scale. The main advantages of self-rating techniques lie in their simplicity, speed, low cost, and non-intrusive nature, as they are conducted after the trial. However, they face considerable criticism due to issues related to post-trial SA data collection, such as the potential correlation of SA with performance and challenges in accurate recall, as well as concerns about their sensitivity.

One widely-used self-rating method is the Situation Awareness Rating Technique (SART), developed by Taylor (1990). SART has ten dimensions on which participants can rate their SA: familiarity with the situation; attention focus; information quantity; information quality; situation instability; attention concentration; situation complexity; situation variability; arousal; and spare mental capacity. In SART, participants provide post-trial ratings for each dimension on a seven-point scale (1 = Low, 7 = High), offering a subjective measure of their SA.

While this method efficiently captures participants' confidence in their own SA, it fails to provide an objective measure of SA (Jones & Endsley, 2004). Its effectiveness can be

compromised by memory decay, as it is conducted at the end of the trial, and by the influence of performance outcomes. For instance, individuals who successfully complete a task might overrate their SA, attributing it to the positive result of the event.

Performance Measures

A performance measurement of SA entails recording and analysing specific aspects of a participant's performance in a given task. These aspects are selected based on their relevance to the task and are used to rate the participant's SA indirectly. The choice of performance indicators varies depending on the nature of the task and the environment in which it is operated. For example, in a study of testing drivers' SA, Gugerty (1997) applied this approach to measure factors like hazard detection, the ability to notice blocking cars, and crash avoidance in a simulated driving environment.

Performance measures in various domains can include the accuracy and speed of decision-making, the effectiveness of communication in team-based tasks, and the ability to maintain operational standards under varying levels of stress or environmental changes. In air traffic control, for example, performance measures might include the accuracy of aircraft routing decisions and the ability to manage high-traffic volumes, both indicative of the controller's SA.

Situational awareness emerged primarily from human factors research in the aviation industry, and most measurement instruments were designed to evaluate pilots and other professionals within a specific context or situation. This raised a concern about whether these context-specified measures can be applied to other research areas. Apart from the aforementioned two main classes of subjective and objective measures, Sætrevik (2013) attempted to use a context-general survey method to measure situational awareness, and developed a 13-item scale to assess three levels of situational awareness. This instrument was validated through a sample of 166 marine personnel and demonstrated reasonable reliability (α

= .74). The results indicated a good fit for the model, as shown by the fit indices with Chi-square = 86.94, df = 62 (Chi-square/df = 1.4), p-value for model = 0.02, CFI = 0.936, TLI = 0.906, RMSEA = 0.049, with upper boundary for two-sided 90% confidence interval at 0.072 and a PCLOSE value at 0.495, indicating that the data have a close fit with the model (n = 166)". Both the maritime and aviation industries share high-risk characteristics and require employees to maintain a high level of situational awareness to ensure safety in dynamic and hazardous situations. The cognitive demands laid on personnel in these domains remain similar, making the insights gained from one context potentially valuable in another.

Traditional methods mentioned above, such as freeze probe techniques, real-time probe techniques, and performance measures, are widely recognised in the aviation industry for their capability of providing an objective snapshot of SA at specific moments in simulated scenarios. However, these approaches require substantial logistical support like aircraft simulators, long timing and preparation, and involvement of experts in flight operating, which make the realization not feasible and impractical for this study. In contrast, Sætrevik's (2013) self-report scale offers a flexible and context-general approach to measuring SA. The items included in this scale assess the three levels of situational awareness—perception, comprehension, and projection. As the primary goal of this study focuses on examining the influence of EI and other psychological factors on SA, by capturing pilots' subjective experience of SA, this scale may provide a more comprehensive understanding of the cognitive and emotional process that underpin situational awareness in aviation.

In this thesis, I employ this approach to assess pilots' situational awareness as the purpose of the study is to broaden the research findings to other safety-critical domains rather than within a single, narrowly defined context.

Career Adaptability

Currently, some scholars argue that EI is not a consistent predictor of work performance (Rode et al., 2007; Zeidner et al., 2004). A reason for this inconsistency might be that some boundary conditions may affect the relationship between EI and work outcomes including performance (Rode et al., 2007). While research has examined a number of such boundary conditions as personality (e.g., conscientiousness, see Rode et al. (2007)), positive and negative effects (Kafetsios & Zampetakis, 2008), job context (Farh et al., 2012), and job control (Abraham, 2000), there are still many boundary factors that need to be explored (O'Boyle Jr et al., 2011). In this thesis, I will advance this aspect of the topic with an emphasis on the moderating roles of one career development variable: career adaptability.

The Concept of Career Adaptability

Rooted in Career Construction Theory (CCT), career adaptability reflects employees' resources and ability for managing tasks and challenges in their career development (Savickas, 1997, 2002; Savickas & Porfeli, 2012). It has been defined as a four-dimensional construct which consists of concern (i.e., preparing for future career tasks), control (i.e., taking responsibility for one's development), curiosity (i.e., exploring possible future selves and opportunities), and confidence (i.e., believing in one's ability to solve problems and to succeed) (Savickas & Porfeli, 2012). Career adaptability equips individuals with the essential competencies and mindset to navigate career transitions, overcome obstacles, and seize opportunities for growth and development. This set of psychosocial resources is especially important in today's dynamic work environment, where rapid technological advancements and shifting market demands can significantly alter the labour market. Numerous studies have found that career adaptability positively predicts favourable work outcomes in a work context such as enhanced work performance, job satisfaction, and career development (Haenggli & Hirschi, 2020; Ohme & Zacher, 2015; Zacher, 2014). Similar results have been reported for

career variables. For example, people with a higher level of career adaptability have expressed stronger career satisfaction (Guan, Zhou, et al., 2015; Kundi et al., 2021) and more easily achieved career success (Al-Ghazali, 2020; Hirschi, 2009). Enhancing career adaptability can help individuals better adapt to changes by proactively implementing strategies and maintaining sustainability when facing career uncertainties.

In today's ever-changing workplace, individuals frequently encounter the stress of career uncertainties and continuous challenges, which require constant emotional and cognitive adaptation. Dealing with these career transitions demands individuals to possess regulation/adaptive qualities like emotional intelligence and career adaptability (Parmentier et al., 2019; Savickas, 2005). Given the self-adaptive nature of adaptability resources, researchers have explored whether the four branches of carer adaptability might function as a mediating variable. A number of studies have investigated whether career adaptability can mediate the relationship between the Big Five personality dimensions and work-related outcomes (Johnston, 2018). However, only a limited number of studies have examined career adaptability as a moderator. Among these, a notable cross-sectional study conducted by Guan, Zhou, et al. (2015) revealed that the relationship between organisational career management and career satisfaction is stronger in individuals who possess higher levels of career adaptability.

Parmentier et al's (2019) two-wave cross-lagged panel design study has demonstrated the causal relationship between EI and career adaptability, highlighting both as important psychosocial resources for individuals to address job-related challenges (Coetzee & Beukes, 2010; Restubog et al., 2020; Savickas & Porfeli, 2012). Although they can function to affect work attitudes and behaviours separately, questions pertaining to whether EI and career adaptability can jointly and interactively influence work outcomes have not been addressed previously, particularly in the safety performance domain. To address this gap, this study will examine the moderating role of career adaptability in the relationship between EI and safety

performance. More specifically, the third study (Chapter 6) will explore how varying levels of career adaptability might influence or alter the impact of EI on safety performance in the workplace.

The Measurements of Career Adaptability

The most widely-used scale for measuring career adaptability is the Career Adapt-Abilities Scale (CAAS) developed by Savickas (2013). This instrument contains a total of 24 items, six of which are designed to measure each aspect of career adaptability, including career concern, career curiosity, career confidence, and career control. This scale has been extensively applied in the field of organisational behaviour and career development and demonstrated excellent reliability and validation (Chan & Mai, 2015; Yoo & Lee, 2019). Furthermore, the Chinese version of the CAAS has also been verified with high validity by substantial studies among Chinese students and employees (Guan, Wang, et al., 2015; Haibo et al., 2018). In this thesis, these psychometric properties will be used to examine pilots' overall career adaptability.

Thriving at Workplace

The Concept of Thriving at Workplace

Thriving is an important indicator of personal self-development and mental health in the workplace. It reflects an individual's temporary psychological state of feeling energetic and experiencing personal growth at the same time. In their socially embedded module, thriving is defined as consisting of validity and learning in two essential aspects (Spreitzer et al., 2005). Validity refers to the sense that one feels of having energy available and 'aliveness', while learning refers to the sense that one is acquiring, of applying knowledge and skills (Spreitzer & Sutcliffe, 2007, p. 538). These two dimensions need to be present simultaneously to thrive as this construct compasses both affective and cognitive perspectives of one's internal experience of development. For example, one may feel energetic and satisfied with his/her job due to positive supervisor support and pleasant colleague relationships, but he/she may not be

thriving if there are no updates in the knowledge and skills matrix as s/he is not learning. In contrast, one may see himself/herself as learning when involved in a training program provided by an organisation but feels burnout in the process due to the intense training therefore s/he is not thriving. This conceptualisation represents two components of subjective well-being: validity represents a pleasant psychological state that embodies a hedonic perspective, and learning represents the realisation of one's potentiality, which represents the eudaimonic facet of well-being.

Thriving and Work Performance

Since the introduction of the model by Spreitzer et al. (2005), thriving at work has attracted increasing attention from scholars who are exploring its implication on work-related outcomes. Empirical research has shown that thriving has positive links with favourable workplace outcomes such as positive overall health, better work performance, heightened creative performance (Christensen-Salem et al., 2021), and proactive job attitudes. Accordingly, individuals who are thriving typically exhibit confidence in processing their jobs with sufficient knowledge and skills. Additionally, thriving individuals tend to show greater passion for learning new things and curiosity for exploring novel techniques to improve themselves. In Spreitzer et al's theory, thriving provides individuals with a subjective measure to regulate feelings and assess their progress in a positive direction. It acts as a tool that individuals can use to check if they need to take proactive steps for further advancement. In short, thriving serves as a self-adaptation resource, guiding individuals towards sustainable and professional development.

Given the benefits of thriving for both individuals (e.g., overall health, job satisfaction) and organisations (e.g., enhanced work performance and lower health-related costs), it is important to explore the antecedents of thriving (Walumbwa et al., 2020). Spreitzer et al. (2005) theory model presented three proximal antecedents of thriving including task focus, exploration,

and heedful relating. These three agentic working behaviours drive individuals to act purposely and experience thriving. Task focus refers to the extent to which individuals spend their mental energy and attention on their assigned duties and complete their job in a satisfactory way. When individuals concentrate on their tasks, they are more likely to complete their work ahead of any deadlines, thus generating a sense of accomplishment and vitality. Meanwhile, focusing on their job can stimulate individuals to actively seek novel strategies to improve work efficiency by acquiring new techniques and skills. Exploration involves a cluster of behaviours that engage in those seeking of new ways to refine routine tasks such as experimentation, taking risks, discovery, and innovation. This exploratory behaviour satisfies their curiosity, makes them feel more vibrant, and also expands their horizons through utilising their possessed knowledge. Heedfully relating refers to the behaviours of taking care of colleagues and coordinating to achieve common goals. When individuals behave heedfully in relating with others, they are most likely to establish solid collaborative relationships with colleagues. This form of positive emotional bonding among co-workers makes individuals feel happy and energetic. Moreover, this heedful relating (i.e., social support) can strength knowledge sharing and encourage learning from others.

During the past few decades, scholars have explored several valuable factors that impact thriving from an organisation's perspective such as workplace support, service leadership (Jaiswal & Dhar, 2017), empowering leadership, stressors (e.g., time pressure and learning demands), and workplace violence (Zhao et al., 2018). Furthermore, there are numerous empirical studies that examined some important enablers from an individual's perspective such as psychological capital (Paterson et al., 2014), proactive personality (Jiang, 2017), and core-self-evaluation (Walumbwa et al., 2018). Although these studies have enriched our understanding of the predictors of thriving in occupational settings, existing research on the influence of emotional intelligence on thriving tends to be limited.

Emotional Intelligence and Thriving

In fact, current research has implied that EI may promote thriving as EI facilitates agentic behaviours whereby emotionally intelligent individuals are more likely to engage in their job (Barreiro & Treglown, 2020; Ravichandran et al., 2011) and initiate greater creativities for further development (Salminen et al., 2021; Xu et al., 2019). Engaged individuals tend to experience thriving because devotion to their work realises the application of knowledge and establishes relations with co-workers (van der Walt, 2018). In fact, when individuals have deep connections with work tasks, they engage at cognitive (effort towards learning) and affective engagement (psychological well-being) levels (Alotaibi et al., 2020; Maguire et al., 2017) which, in turn, can promote the experience of learning and vitality. In this research, I will examine whether emotional intelligence promotes the generation of thriving at work. Furthermore, this study will explore the mediating role of thriving on the relationship between EI and safety performance.

The Measurements of Thriving

With the introduction of the Socially Embedded Model of Thriving (Spreitzer et al., 2005), Porath et al. (2012) developed a two-dimensional instrument to assess the key components of thriving: vitality and learning. This measure has been used to examine the relationships among thriving and various work outcomes such as task performance, job satisfaction, and subjective health, and presented an incremental predictive validity beyond other related constructs like positive affect and work engagement (Kleine et al., 2019). The original version of this measurement includes a total of ten items, where five items were designed for measuring vitality and the other five items were used for assessing learning. Later on, Jiang (2017) optimised this ten-item measurement to a more concise six-item version in Chinese context research and it exhibited sound validity. The results in Jiang's study indicated sound reliability with the Cronbach's alphas for learning, vitality, and overall

thriving at 0.67, 0.75, and 0.80, respectively. In this thesis, I will use this shorter Chinese version to examine pilots' thriving at work.

Training

Training is one of the essential means to improve employees' performance in the workplace (Bartel, 1995; Bozionelos et al., 2020; Elnaga & Imran, 2013). Past research on human resources management shows that both the volume and quality of training has a direct and positive influence on employee and organisation performance (Aguinis & Kraiger, 2009; Subramony et al., 2008). At the organisational level, numerous empirical studies demonstrate that training significantly contributes to the improvement of organisation performance such as productivity, financial performance, sustainable development, and innovative performance (Sung et al., 2018). At the individual employee level, training services act as the accelerator of enhancing their human capital (i.e., skills, knowledge, and abilities) that can strengthen their competencies and performance (Crook et al., 2011; Hernaus et al., 2021; Stiles & Kulvisaechana, 2003). Through sufficient work-related training, employees can recognise the responsibilities and duties, acquire the necessary job-specific skills and knowledge, and conduct their tasks effectively. Moreover, effective training provides employees with the opportunities to access the latest technology in their field, develop their skills, and transform newly-acquired abilities in their field to improve performance (Dermol & Čater, 2013). In study 2 (Chapter 5), I will address the impacts of training on employees' performance in the workplace from an individual perspective. Specifically, I will focus on the potential impact of insufficient training as perceived by the individuals, thereby examining how a lack of training might affect pilots' safety performance.

The Importance of Training

Training refers to the learning process that prepares employees with new knowledge, skills, abilities, and professional development opportunities (Guan & Frenkel, 2019). Generally,

training can be categorised into general training and specific training. General training refers to the essential set of knowledge and skills that can apply across various companies or industries. This type of training forms the basic occupational capital that can be provided by either the company or other external training institutions. Meanwhile, specific training refers to the training program that is especially designed for relevant positions that integrate a series of skills and knowledge (Nembhard, 2007). This type of training is mostly provided by the organisation and may have limited application to other companies. In the aviation industry, there are a variety of specified training programs. Most of these training programs are typically mandated by the civil aviation regulations to ensure that the operators possess the necessary capabilities, knowledge, and skills to perform their tasks precisely. Such specialised training is essential to maintain this industry's high safety standards and operational efficiency.

Previous research proved that job-related training is the most direct way that individuals can apply newly-acquired knowledge and skills into their work practice. Some training approaches, such as on-the-job training, offers employees with the opportunity to examine what they have learned in a real working environment. The interaction between learning and practice allows them to acquire skills and experience from the mentors directly and deepen their insights about their job. Moreover, receiving professional training has been proved to significantly increase an individual's confidence in performing work tasks. In addition, training activities promote connection-building among co-workers during the training interactions (Hernaus et al., 2021). For example, team-building training exercises are instrumental in establishing trust relationships through knowledge sharing, effective communication, and mutually supporting others to complete the task successfully (Klein et al., 2006).

Training, as an important human resource practice, is also critical in sustaining individuals' competitive advantage and employability (Jiang et al., 2012). Attending training courses can update individuals' abilities and motivate their learning desires and self-

improvement ambitions. Spreitzer et al. (2012) study shows that when individuals transfer what they have learned from training to practice, they feel achievement and thrive to reach higher levels of performance continuously. From the perspective of social exchange theory, employees tend to repay the organisation by exerting their work engagement and elevating work performance, as they view their training as a benefit provided by the organisation (Karatepe, 2013). For example, Guan and Frenkel (2019) found training improved employees' in-role task performance and extra-role performance in a Chinese context. It has been widely acknowledged that sound training practices boost individuals' skills growth, drive learning intention, and motivates them to engage with their work.

In contrast, insufficient training can hamper employees' work performance and cause a series of negative outcomes such as low work engagement, low-level job satisfaction, decreased affective commitment, and heightened turnover intention (Cheng & Waldenberger, 2013; Shuck et al., 2014; Sieben, 2007). That is, an individual lacking in job-specific training is most unlikely to carry out the tasks properly as insufficient training often leads to a mismatch between job requirements and personal abilities. An individual who possesses fewer capital resources (i.e., skills, technique, and knowledge) than the job demands may experience anxiety and overwhelming pressure, and tends to pursue other opportunities that are more aligned with their skills. Also, a shortage of training opportunities could compromise employee contributions and commitment over time because they feel they are not valued by the organisation. The frustrating feeling of failure to perform their work reduces work enthusiasm, increases anxiety, and this could further weaken confidence. Furthermore, a dissatisfaction with training can weaken their willingness to invest emotional and cognitive resources at work which, in turn, will lead to a lower-level of work engagement (Memon et al., 2016). The depletion of the intrinsic motivation to engage in work in particular can cause a series of consequences such as inferior work attitudes, less attention paid to detail, and

underperformance. Moreover, numerous existing aircraft incidents and accidents reports worldwide have identified insufficient training or poor training quality as a primary factor causing pilots' unsafe behaviours (Cline, 2018; Guo et al., 2021; Small, 2020). This research will examine the influence of insufficient training as a boundary condition on individuals' work behaviours, such as safety performance, given that not all organisations can afford extensive training programs.

The measurements of training in this thesis

Given the focus of Study 2 (Chapter 5) on assessing the impact of insufficient training on pilots' safety performance, it is practical to use a measurement tool designed explicitly for evaluating pilot training. After reviewing relevant literature, I have identified a scale developed by Evans et al. (2007) that suits this research objective. In their study on aviation safety climate, they developed a four-item scale dedicated to assessing pilot training, tested on a sample of 940 Australian commercial pilots. The results of this study demonstrated that the scale possesses robust reliability (Cronbach's alpha = .86).

While the existing scales provide valuable insights, the measures used in this thesis may not fully capture the complexity of the issues faced by Chinese pilots in their training. Instead, it provides insights into facets of safety climate, which are relevant to understanding the overall effectiveness of training within the broader context of workplace safety. Given the aims of this research, this short self-report scale is suitable for assessing the perceived adequacy of training as it relates to safety outcomes. It helps to capture the participants' perceptions of how well the training they received prepares them to handle safety-related challenges, which is aligned with the focus of this study. Future research may consider developing context-specific measures better to assess training deficiencies and their impact on safety performance.

Conclusion

In conclusion, the literature review provides insights into the relationships between EI, situational awareness, safety performance, thriving, career adaptability, and training inadequacy in the workplace. The current literature suggests that EI may play a crucial role in enhancing safety performance by influencing individual ability to perceive, understand, and manage emotions effectively. High levels of EI are associated with heightened situational awareness, enabling individuals to accurately interpret and respond to changing circumstances, hazards, and risks. Moreover, EI has been shown to positively impact decision-making, problem-solving, and communication skills, all of which are critical components of maintaining a safe level of work performance. Situational awareness may act as a mechanism through which individuals with higher EI can interpret and comprehend their environment, identify potential risks and hazards, and make informed decisions to ensure safety.

The main research questions in this thesis aim to investigate the influence of EI on pilots' safety performance, with a particular focus on the mediating roles of situational awareness and workplace thriving. This investigation aims to determine how EI may enhance pilots' safety performance (safety compliance and safety participation) through improved situational awareness and an increased sense of thriving, which encompasses both vitality and learning in the workplace. Furthermore, this thesis will investigate how training inadequacy and the level of career adaptability might modify these mediation pathways. Specifically, it aims to understand whether insufficient training and high career adaptability will strengthen or weaken the impact of EI on safety performance through situational awareness and thriving.

Chapter 3

Methodology

This chapter provides a comprehensive overview of the research methodology used in this thesis, which aims to examine the impact of Emotional Intelligence (EI) on pilots' safety performance. It provides a detailed map of the research design and implementation, how this study was conducted, and what steps were taken to ensure its validity and reliability. The topics cover the design of the research model, the selection of the target participants, the methods applied for data collection and analysis, and a discussion of the study's limitations and suggestions for future study. This chapter elaborates how this study was conducted including the research model design, the selection of target group, methods of data collection, and the analysis procedures.

Research Design

Purpose of this thesis

Building upon the existing evidence of EI's positive influence on work performance, this thesis consists of three interconnected studies, each exploring the potential positive impact of EI on safety performance, a specific aspect of work performance. In this research model, EI is the independent variable while pilots' safety performance is the dependent variable, and there will be a focus on examining their interplay. In addition, the model incorporates situational awareness and thriving as mediating variables, offering valuable insights into how these factors enhance safety performance. Moreover, the theoretical model considers training inadequacy and career adaptability as moderating factors, exploring their roles in the connection between EI and safety performance.

Study 1 (Chapter 4) examines the relationship between EI and pilots' safety performance, with situational awareness serving as a mediating variable. This primary study establishes the groundwork by exploring how EI influences safety performance directly and through the lens of situational awareness. Study 2 (Chapter 5) examines how training inadequacy may modify the relationship between EI and safety performance among

commercial pilots. This study aims to disclose whether the influence of training inadequacy weakens the effectiveness of EI in enhancing safety performance. Study 3 (Chapter 6), the final study, aims to explore the pathway connecting EI to safety performance via thriving, considering career adaptability as a moderating influence.

Research Approach

This thesis employs a quantitative approach to investigate the relationship between EI and safety performance among commercial pilots, forming the basis of the entire research model. The quantitative approach was chosen for this study as it is the preferred methodology by many researchers (McCusker & Gunaydin, 2015). The primary advantage of this approach is the capacity to collect large-scale data from a significant number of participants. This can generalise the research findings to a broader population beyond pilots in the commercial aviation industry and expand the application of results to other research domains. Employing both online surveys and paper questionnaires makes it more feasible to gather responses from a wide range of participants (Rahman, 2020; Tuli, 2010).

The quantitative method enables researchers to analyse the relationships between variables in a systematic and rigorous manner. Utilising standardised instrument scales and numerical data makes it possible to evaluate the influence of both personal and organisational factors, such as situational awareness, thriving, career adaptability, and training, on individuals' safety performance. Statistical techniques, such as regression analysis, will be used to identify correlations, trends, and potential predictive factors (Goertzen, 2017; Nardi, 2018). Quantitative methods aid in identifying patterns, trends, and associations, thereby providing a more precise understanding of the impact of EI on safety performance within the commercial aviation industry.

Participants

Given this research's focus on investigating pilots' safety performance, it was critical to select targeted participants who were not only actively engaged in aviation operations but also had minimum experience in this field. Therefore, full-time pilots (Studies 2 and 3) working in airline companies were identified as the most appropriate participants. Moreover, in order to investigate the potential impact of career-related factors like career adaptability and training on safety performance, the participant pool was expanded to include full-time pilot trainees (Study 1) from flight training colleges. This specifically targeted individuals in the pre-employment phase. The combination may provide a comprehensive understanding of how these factors impact the relationship between EI and safety performance across different stages of pilots' careers.

By examining both pilot trainees and experienced pilots, the study aims to gain a deeper understanding of the challenges faced by pilots at various career stages, such as lower career mobility, and how these challenges influence safety outcomes. Consequently, the studies' findings can provide practical recommendations for improving aviation safety practices. For example, developing targeted EI training interventions in flight training colleges aims to enhance safety performance from the early stages of pilots' careers. Meanwhile, findings from experienced pilots can contribute to guidelines and strategies implemented within airline companies to leverage EI for improved safety outcomes.

Incorporating two distinct sample groups — full-time trainees in Study 1 and full-time pilots in Study 2 and 3 — enhances the validity and reliability of the study's findings. The positive influence of EI on safety performance has been verified across both early-stage and experienced professionals.

Data Collection

In this cross-section study, prior to data collection, the participants' selection criteria were carefully determined. The criteria included geographical locations, the nature of flight training colleges, and the attributes of airline companies. By setting these criteria, the study aimed to ensure a diverse pool of participants with diverse backgrounds and experiences that provided a broader representation of the aviation industry.

For Study 1, data collection was conducted at two flight training schools. The first school was a private flight training institution located in the northern region of China, with three flight bases and approximately 500 enrolled trainee pilots. The second school was the largest flight training institution in China, situated in the southwest region, and operates eight flight bases and trains over 1000 pilots annually. By choosing these two flight training schools that vary in size, location, and organisational structure, the study ensures an inclusive representation of the flight training landscape. In practice, there are two types of flight training schools in China: one is privately-owned, the other is government-owned. This selection provides an in-depth examination of the impact of EI on safety performance across diverse training environments and program structures.

Paper-based and online questionnaires were employed to collect data to suit participants' needs. Pilots, unlike many other professions, do not work at an office in a fixed location. Their primary workplace is the aircraft cockpit, and work locations change frequently based on flight schedules, routes, and assignments, making it challenging to distribute and collect the paper surveys. For those who could use the paper-based questionnaires, they were thoughtfully designed, sealed within envelopes, and then distributed to the trainees and pilots by their instructors or line managers. This traditional approach allowed for direct interaction with the participants. On the other hand, instructors or managers shared the online questionnaire links via digital platforms (e.g., WeChat), which

allowed trainees and pilots the convenience of completing the survey at a time that suited them best as their training or work locations changed frequently based on flight schedules. This dual data collection approach ensured participants' engagement and improved response rates.

The questionnaire employed in this study consisted of two rounds. These two-wave surveys were implemented between May 2017 and September 2017. The first round focused on capturing essential demographic information, including education level, gender, age, duration of enrolment, and EI. This initial phase aimed to establish a baseline understanding of the participants and their characteristics in relation to EI and safety performance. Approximately one month later, the second round of questionnaires was administered to those who had completed the first round. The second round included variables related to situational awareness and safety performance. This two-wave survey may help minimise the common method bias when collecting independent and dependent variables at the same time.

The surveys were distributed to 268 potential pilot trainees. A total of 168 surveys were returned for Time 1, resulting in a response rate of 62.69%. After one month, the Time 2 survey was administered to the Time 1 respondents, with 142 participants responding, yielding a response rate of 84.52%. Among both groups of respondents, 117 participants had usable questionnaires successfully matched (in the questionnaire information sheet, participants were asked to create a unique four-digit code with mixed numbers and letters which would be used to match their two rounds of questionnaires). The majority of the trainees were male (95.73%, n = 112), and most were between 19 and 25 years old (87.18%, n = 102). Regarding education, 75.21% (n = 88) held bachelor's degrees, followed by a high school-level education (17.09%, n = 20), postgraduate qualifications (5.99%, n = 7), and tertiary diplomas (1.71%, n = 2).

For Studies 2 and 3, the survey targeted pilots working in two airline companies: one regional airline and one state-owned airline. This intentional choice was made to represent diversity in organisational structures, operational contexts, and management styles prevalent in the Chinese aviation industry. This approach intends to present the complete picture of the characteristics in Chinese commercial aviation and the impact of EI on safety performance across different types of airlines.

Using a similar approach as the one applied in collecting the trainee samples, both online surveys and paper questionnaires were distributed. The questionnaires consisted of two distinct rounds. The first round of the questionnaire gathered demographic details, and questions measuring EI, training, thriving, and career adaptability. Approximately one month later, the second-round questionnaire contained questions measuring situational awareness and safety performance. While the two sample groups — pilot trainees and experienced airline pilots — share certain commonalities such as required operational skills and psychological capital resources (e.g., situational awareness), there are significant differences between them. Pilots in airline companies continue to develop their skills and accumulate experience while facing higher performance standards and increased stress related to safety considerations. Consequently, it was anticipated that their responses regarding the influence of EI on safety performance may differ from those of the trainees, who are still in the early stages of their career paths.

With the assistance of fleet managers, the surveys were distributed to the potential pilots. At Time 1, 211 participants responded with usable data, resulting in a response rate of 79.32%. At Time 2, 161 participants returned valid questionnaires, leading to a response rate of 76.30%. Using a unique code comprised of numbers and letters, the questionnaires of 133 pilots were successfully matched. The sample predominantly consisted of male respondents (97.7%), with an average age of 28.66 years (SD = 4.11), and all participants had completed

tertiary education. The average job tenure was 38.86 months (SD = 41.27), with a range from 1 month to 85 months.

Measurements

Translation-Back-Translation Process

As the majority of the measurement tools utilised in this thesis were originally developed in English, a rigorous translation process was undertaken to ensure linguistic accuracy and maintain the integrity of the constructs being measured. Prior to conducting the formal survey, a team of researchers proficient in both English and Chinese collaborated to translate the questionnaires into Chinese, the participants' native language.

The translation process followed established guidelines to ensure the validity and reliability of the translated instruments. Initially, the questionnaires were translated from English to Chinese by one bilingual expert, carefully considering the cultural nuances and idiomatic expressions specific to the Chinese language. This translation aimed to capture the intended meaning and maintain the conceptual equivalence of the original items. Then, to further validate the translated questionnaires, a back-translation step was utilised. In this step, another bilingual expert, who had no prior knowledge of the original English version, independently translated the Chinese version back into English. This back-translated version was then compared with the original English questionnaire to identify and rectify any discrepancies or potential misunderstandings (Sousa & Rojjanasrirat, 2011).

During this verification phase, discrepancies between the back-translated version and the original English questionnaire were carefully examined and resolved through iterative discussions among the language experts and the research team. Any necessary adjustments were made to ensure that the translated questionnaires accurately captured the intended meaning of the original items, and that no critical information or nuances were lost in translation. By adhering to established translation guidelines and employing expert input, the

study aimed to minimise potential misunderstandings and ensure the measurement tools accurately captured the constructs of interest in the Chinese context.

The measurement items were assessed using a five-point Likert-type response scale, where participants were asked to rate their level of agreement on each item, ranging between "strongly disagree" (1), "disagree" (2), "neither agree nor disagree" (3), "agree" (4), and "strongly agree" (5).

Measurement Instrument for Variables

Emotional Intelligence (EI)

The EI measurement used in this research is the Wong and Law Emotional Intelligence Scale (WLEIS), developed by Wong and Law (2002). This self-report scale contains 16 items that assess four dimensions of EI in terms of self emotional appraisal (SEA), others' emotional appraisal (OEA), regulation of emotion (ROE), and use of emotion (UOE). Each dimension has four measurement items separately. The main reason why I chose this measure was that this scale was initially developed using a sample of Chinese employees and it has demonstrated high reliability in numerous empirical examinations in Chinese contexts (Kong, 2017; Law et al., 2008), aligning well with the focal setting of this research. Additionally, this self-report WLEIS for measuring ability EI has shown high test-retest reliability across different groups, such as university students, teachers, and salespeople (Pacheco et al., 2019; Wong et al., 2004; Wong et al., 2010). In Study 1, the Cronbach's alpha values for each sub-scale were as follows: SEA = .834, OEA = .826, UOE = .819, ROE = .891, respectively. The overall EI scale Cronbach's α value was .92, indicating a high level of reliability. This suggests that the items on the EI scale were internally consistent and effectively measured the construct of emotional intelligence reliably among the pilot trainees who participated. Likewise, in Studies 2 and 3, each sub-scale Cronbach's α values were as follows: SEA = .777, OEA = .852, UOE = .839, and ROE = .881. The total Cronbach's α for

the pilots' EI was found to be .89, maintaining strong internal consistency of the EI scale. This consistent and high Cronbach's α values in Studies 1, 2, and 3, provide robust evidence for the reliability of the EI measurement instrument across different research groups.

The high reliability of the EI scale in all three studies suggests that it effectively captured participants' emotional competencies, including their ability to appraise, regulate, and manage emotions. Furthermore, the consistency in the scale's reliability across different group samples strengthens the findings related to emotional intelligence in this thesis. The set of 16 items is listed in Table 3.1 below.

Table 3.1

Emotional Intelligence (EI) measurement

No.	Four Dimensions
	Self-emotion appraisal (SEA)
1	I have a good sense of why I have certain feelings most of the time.
2	I have a good understanding of my own emotions.
3	I really understand what I feel.
4	I always know whether or not I am happy.
	Others' emotion appraisal (OEA)
5	I always know my friends' emotions from their behaviour.
6	I am a good observer of others' emotions.
7	I am sensitive to the feelings and emotions of others.
8	I have a good understanding of the emotions of people around me.
	Use of emotion (UOE)
9	I always set goals for myself and then try my best to achieve them.
10	I always tell myself I am a competent person.
11	I am a self-motivated person.
12	I would always encourage myself to try my best.
	Regulation of emotion (ROE)
13	I am able to control my temper and handle difficulties rationally.
14	I am quite capable of controlling my own emotions.
15	I can always calm down quickly when I am very angry.

16	I have good control of my own emotions.

Situational Awareness

Situational awareness was assessed using a 13-item scale developed by Sætrevik (2013). These items were designed to measure three distinct levels of situational awareness. Specifically, four items pertained to the perception of safety issues (Level 1); five items focused on the comprehension of the safety situation (Level 2); and four items addressed forecasting the safety situation in the near future (Level 3). In Studies 1, the Cronbach's alpha values for each level were as follows: Level 1 = .636, Level 2 = .785, and Level 3 = .47, respectively. The total Cronbach's α was .84. In Study 2, the Cronbach's α values for each level are as follows: Level 1 = .448, Level 2 = .61, and Level 3 = .319. The total Cronbach's α for situational awareness was recorded at .722, indicating a high level of internal consistency among the items measuring situational awareness in these two studies. The high Cronbach's α values across these two independent studies suggests that the situational awareness scale is a reliable measurement tool (Sætrevik & Hystad, 2017; Sætrevik & Hystad, 2021).

Although Situational Awareness (SA) consists of three levels—perception, comprehension, and projection—these levels explain the developmental process of SA in information processing, ultimately formalising the effective overall SA. Therefore, measuring an individual's SA at only one of these levels does not provide significant practical value, as it fails to capture the complete picture. In this research, SA was treated as a whole concept rather than broken down into three levels. The completed set of 13 items is listed in Table 3.2 below.

Table 3.2

Situational Awareness Measurement

No.	Test Items	Remarks
1	I notice when an unsafe situation is about to arise at my workplace (level 3).	
2	I sometimes lose track of information relevant for maintaining safety in my work (level 1).	*
3	It's hard to know which consequences my actions have for safety (level 2).	*
4	I sometimes lose track of safety due to receiving too much information at the same time (level 1).	*
5	I plan ahead in order to handle various adverse incidents that may arise (level 3).	
6	I know which information is relevant for safety and which information is not relevant for safety (level 2).	
7	It is impossible to predict what will happen during an adverse incident (level 3).	*
8	I know how to act to maintain safety (level 2).	
9	I feel confident that I know how to deal with the various adverse incidents that may arise (level 2).	
10	Some of the information I need to assess safety is presented in a way that makes it difficult to understand (level 1).	*
11	I usually know what's going to happen next with regards to safety (level 3).	
12	The information I need to assess safety is easily available (level 1).	
13	I know which situations in my work involves higher risk than others (level 2).	

Note: The test items marked with an asterisk (*) are reverse-coded items.

Safety Performance

Safety performance was evaluated using Griffin and Neal (2000) seven-item scale, which has been extensively utilised to assess safety-related work performance across various industries, including aviation (Jones, 2014; Liu et al., 2023). Among the seven items, four

items measured safety compliance, while the remaining three items measured safety participation.

In Study 1, the Cronbach's alpha values for each sub-scale are as follows: Safey Compliance = .93, and Safey Participation = .826, respectively. The total reliability of safety performance indicator of Cronbach's α was .93. Similarly, in Studies 2 and 3, each sub-scale Cronbach's α values are as follows: Safey Compliance = .912 and Safey Participation = .847. The total Cronbach's α was recorded at .93. These high Cronbach's α values suggest that the safety performance scale used in all three studies exhibited strong internal reliability, implying that the items were highly consistent in measuring the construct of safety performance across the different samples and conditions. The seven items are listed in Table 3.3 blow.

Table 3.3

Safety Performance measurement

No.	Two Dimensions
	Safety Compliance
1	I carry out work in a safe manner.
2	I use all necessary safety equipment to do my job.
3	I use the correct safety procedures for carrying out my job.
4	I ensure the highest level of safety when I carry out my job.
	Safety Participation
5	I put in extra effort to improve the safety of my workplace.
6	I help my co-workers when they are working under risky or hazardous conditions.
7	I voluntarily carry out tasks or activities that help improve workplace safety.

Career Adaptability

Career adaptability was measured by the Career Adapt Abilities Scale (CAAS) Form 2.0, a 24- item measurement instrument developed by Savickas and Porfeli (2012). To be

specific, six items were allocated to assess each of the four dimensions of career adaptability: namely, career concern, career control, career curiosity, and career confidence. The Cronbach's alpha values for each sub-scale are as follows: Concern = .901, Curiosity =.857, Control = .82, Confidence = .924, respectively. The total Cronbach's α was .89. This high Cronbach's α value suggests strong internal consistency among the items used to assess the construct of interest. The total 24 items are listed in Table 3.4 below.

Table 3.4

Career Adaptability Measurement

No.	Four Dimensions
	Concern
1	Thinking about what my future will be like.
2	Realising that today's choices shape my future.
3	Preparing for the future.
4	Becoming aware of the educational and career choices that I must make.
5	Planning how to achieve my goals.
6	Concerned about my career.
	Control
7	Keeping upbeat.
8	Making decisions by myself.
9	Taking responsibility for my actions.
10	Sticking up for my beliefs.
11	Counting on myself.
12	Doing what's right for me.
	Curiosity
13	Exploring my surroundings.
14	Looking for opportunities to grow as a person.
15	Investigating options before making a choice.
16	Observing different ways of doing things.
17	Probing deeply into questions I have.
18	Becoming curious about new opportunities.

	Confidence
19	Performing tasks efficiently.
20	Taking care to do things well.
21	Learning new skills.
22	Working up to my ability.
23	Overcoming obstacles.
24	Solving problems.

Thriving

Pilots' thriving at work was assessed using a six-item scale refined by Jiang (2017). The scale is an adaptation of Porath et al.'s (2012) original ten-item scale, tailored to fit the Chinese context. The reliability of each thriving subscale, as indicated by Cronbach's α, was as follows: Learning = .872 and Vitality = .77, respectively. The total Cronbach's α value was .87. This high Cronbach's α value indicates a good internal consistency and confirms that the items are closely related and consistently assess the construct of thriving at work. The complete set of six items is presented in Table 3.5 below.

Table 3.5

Thriving Measurement

No.	Two Dimensions
	Learning
1	I continue to learn more as time goes by.
2	I am learning.
3	I am developing a lot as a person.
	Vitality
4	I feel very energetic.
5	I feel alert and awake.
6	I am looking forward to each new day.

Safety Training Inadequacy

Safety training inadequacy was measured using a four-item scale developed by (Evans et al., 2007). The scale was specifically designed to measure the perception of safety training within pilots' group. The Cronbach's α for safety training inadequacy was .85, which indicated the reliability of the measurement instrument and supports the validity of the findings related to safety training inadequacy. The four items are listed in Table 3.6 below.

Table 3. 6

Training Inadequacy Measurement

No.	Test Items
1	Training was received at regular intervals to refresh and update knowledge.
2	Regular training was provided for a range of emergency situations.
3	Company training provided adequate skills and experience to carry out normal operations safely.
4	Training was received when new procedures or equipment was introduced.

Data Analysis

Handling of Missing Data

After collecting both the paper-based and online questionnaire data, I addressed the missing values using multiple imputation, a technique proposed by Bernaards and Sijtsma (2000). This statistical technique allows for the estimation of missing values based on the patterns observed in the dataset, creating multiple complete datasets where the missing values are filled in with plausible data points. For example, when a participant had missing data on several items of a variable's scale, but not all items, I applied the Full Information Maximum Likelihood (FIML) method, following the approach to impute these missing values. The FIML method utilises all available data patterns to estimate the missing values, thereby making full use of the information collected. This approach does not require the deletion of

cases with partially missing data, which can preserve the sample size and reduce potential bias.

Nevertheless, questionnaires were deemed invalid and excluded from further analysis if a participant left more than one-third of the items in a particular test variable unanswered, or if the questionnaire contained responses that were obviously nonsensical or random, indicating potential response bias, or the questionnaire contained incomplete or missing key information (e.g., gender, or the unique code for matching questionnaires). This approach aimed to retain data completeness while ensuring data accuracy and reliability for subsequent analyses.

Data Analysis

Confirmatory Factor Analysis (CFA)

The data analysis in this research primarily utilised the Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) techniques. Initially, CFA was employed to verify the latent factors of the multifactorial structure of key variables, such as Emotional Intelligence (EI), situational awareness, career adaptability, and safety performance. For each construct, factor loadings, which represent the relationship between observed variables and their underlying latent construct, were examined to confirm the strength and significance of these relationships. The fit of the measurement model was evaluated using several indices, including the chi-square statistic, the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). The recommended acceptable model fit criteria are CFI values above .90, RMSEA values below .08, and SRMR values below .08, indicating a satisfactory fit between the model and the data (Brown & Moore, 2012; Hu & Bentler, 1998).

Structural Equation Modelling (SEM)

Following the confirmation of the measurement models, Structural Equation Modelling (SEM) was used to test the hypothesised relationships between EI, safety performance, and additional variables such as mediators (e.g., situational awareness and thriving) and moderators (e.g., training inadequacy and career adaptability). SEM was chosen as it allows for the simultaneous testing of complex relationships among multiple variables, which is essential given the multidimensional nature of the constructs involved in this study (Hooper et al., 2008). Covariance-based SEM has been used extensively to test complex theoretical models in psychological and behavioural research (Afthanorhan, 2013). Since this study aims to validate a hypothesized framework that links EI, SA, safety performance, and other related variables outlined in Chapter 1, covariance-based SEM is ideal for confirming whether the proposed theoretical model fits the observed data (Astrachan et al., 2014).

Furthermore, the research involves examining direct and indirect effects, and moderating influences, which create a complex variety of relationships among the variables. Covariance-based SEM is more appropriate for capturing these intricate relationships because it can account for measurement errors and simultaneously estimate the relationships among latent variables (Afthanorhan et al., 2016).

Specifically, the SEM analysis involved specifying a model based on the theoretical framework developed in Chapter 1, which included direct relationships from EI to safety performance. Additionally, the analysis examined potentially indirect paths mediated by factors like situational awareness (in Studies 1 and 2) and thriving (in Study 3), and the moderating roles of career adaptability (in Study 3) and training inadequacy (in Study 2) on these core relationships.

Software-SPSS and Hayes' PROCESS Macro

The analysis of the collected data was conducted using the Statistical Package for the Social Sciences (SPSS), using specific version 22 at that time. Additionally, Hayes' PROCESS macro was employed to explore the mediating and moderating pathways between Emotional Intelligence (EI) and safety performance in the research model. In particular, Model 74 in Hayes' PROCESS macro was employed to explore the roles of EI both as a predictor and a moderator in Study 1. Model 74 is a sophisticated model designed for investigating moderated mediation models in which the predictor is also a moderator. In Study1, EI is only the predictor of safety performance, but serves as a condition factor on the relationship between situational awareness and safety performance.

For Studies 2 and 3, Model 7 from Hayes' PROCESS macro was used to explore the mediating role of variables such as situational awareness (Study 2) and thriving (Study 3), while also considering how this indirect effect is altered by other variables like training inadequacy (Study 2) and career adaptability (Study 3). Model 7 is designed to assess both mediation and moderation within the same model. By applying Model 7, the research was able to address questions about whether the strength of EI's impact on safety performance through these mediators (e.g., situational awareness and thriving) depend on the level of the moderator, providing a further understanding of the conditions under which EI is most influential.

Indicators: Situational Awareness — Parcelling Approach

Before testing the hypotheses, CFA was conducted to examine the discriminant validity of the four focal study variables (i.e., EI, situational awareness, career adaptability and safety performance) measured by multiple items. Considering the relatively small sample size and the large number of measurement items, I followed the recommendation (Little et

al., 2002) in creating item parcels for situational awareness to reduce the potential inflation errors.

During my search for feasible measurement instruments for situational awareness, I found that the predominant approach for assessing situational awareness in the aviation field involved using flight simulators or other equipment to create a variety of scenarios, then observing pilots' response times and problem-solving abilities. However, this approach was not suitable for my research due to its high cost and complexity. Conducting such simulations would require significant financial resources. This cost is not limited to the use of flight simulators or other specialised devices for tracking pilots' eye movements, but also includes extensive input from experts in aircraft operation. The involvement of the experts' time, expertise, and the necessary technical equipment made the approach less feasible within my study's budget and resources. After conducting a thorough literature review, I identified a self-report questionnaire for situational awareness developed by Sætrevik (2013). Despite its relevance and convenience to practice, this scale has seen limited use in subsequent studies and has shown relatively low reliability in my study. Specifically, the results from Study 1 indicated that the initial Cronbach's α for situational awareness was .618, which is less than the optimal threshold of .70 (Taber, 2018).

To enhance the reliability and validity of the assessment, I implemented a parcelling technique, inspired by previous scholars, particularly Lin et al. (2012). This technique was necessary given the small sample size and was designed to optimize the reliability and structural integrity of the SA measure. Following the advice of Little et al. (2014), To improve the reliability of the situational awareness questionnaire and optimise the model structure, I incorporated the parcelling technique as recommended by Bandalos (2002) and Lin et al. (2012) . This technique is supported by the factor matrix (Table 3-7), which indicates the loadings of each item on the factor. Drawing on the results of Exploratory Factor Analysis (EFA), I created three parcelled indicators to reoresent the three hierarchical levels of situational awareness. In this process, items were systematically allocated to create three parcelled indicators: SA Indicator1, SA Indicator2, and SA Indicator3. Each indicator

represents a mix of items with varying degrees of factor loadings. For example, SA Indicator1 included items SA6 (the item with the highest loading) with SA1 (the item with the lowest loading), and additional items SA11, SA12, and SA2. This way of grouping items ensured an even distribution of items across the parcels (see below Table 3.7). Then the mean score for each parcel was calculated and used as the score for the corresponding indicator. After implementing the parcelling technique, the Cronbach's α for the SA indicators significantly improved to .865, indicating a substantial enhancement in reliability.**Table 3.7**

New SA Indicators

Factor Matrix		
	Factor	
SA6_L2	.928	SA Indicator 1
SA8_L2	.892	SA Indicator 2
SA9_L2	.828	SA Indicator 3
SA11_L3	.756	SA Indicator 1
SA13_L2	.674	SA Indicator 2
SA3_L2	.534	SA Indicator 3
SA2_L1	.530	SA Indicator 1
SA5_L3	.506	SA Indicator 3
SA4_L1	.483	SA Indicator 2
SA12_L1	.429	SA Indicator 1
SA10_L1	.312	SA Indicator 3
SA7_L3	.301	SA Indicator 2
SA1_L3	.156	SA Indicator 1

Note: Extraction method: Maximum Likelihood. A. 1 factors extracted. 5 iterations required.
SA Indicator1=SA6, SA1, SA11, SA12, SA2
SA Indicator2=SA8, SA7, SA13, SA4
SA Indicator3=SA9, SA3, SA5, SA10

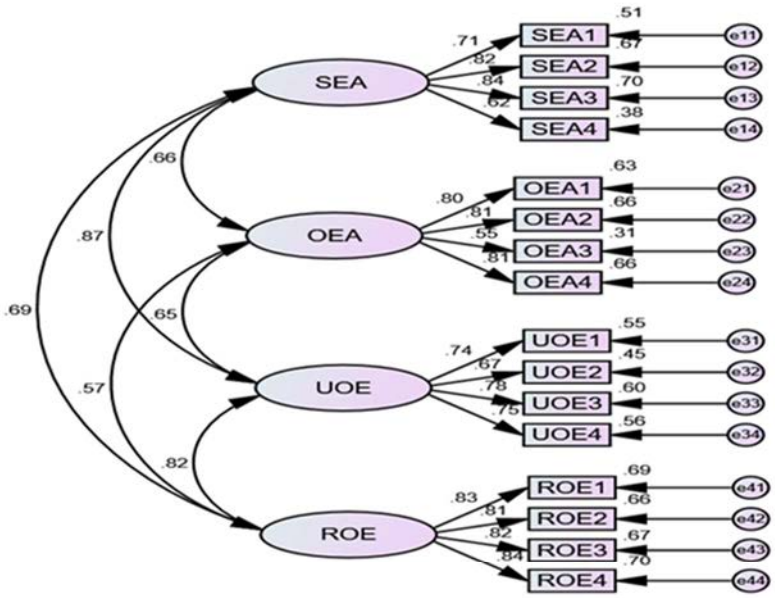
Confirmatory Factor Analysis — EI

Wong & Law's (2002) four-factor model of EI measurement includes Self-Emotion Appraisal (SEA), Others' Emotion Appraisal (OEA), Use of Emotion (UOE), and Regulation of Emotion (ROE). In this research, I chose to use the four dimensions factors of EI as indicators in the analyses rather than the full set of 16 individual items. This approach can reduce the model's complexity without compromising the integrity of the theoretical model in SEM and provide a clearer interpretable path. Figure 3-1 presents the results of the CFA. All

16 items have significant factor loadings ranging from .55 to .84, sufficiently high and statistically significant ($p < .001$). The correlations between these four factors were .57 to .87, suggesting that four factors captured each unique aspect of EI.

Figure 3.1

CFA-EI Results



Note. SEA = Self-Emotional Appraisal, OEA = Others' Emotional Appraisal, UOE = Use of Emotions, ROE = Regulation of Emotions.

The results in Table 3-8 show a good fit for the four-factor EI model. Specifically, the chi-square to degrees of freedom ratio ($\chi 2/df$) stood at 1.66, indicating a satisfactory fit (Hu & Bentler, 1999; Kline, 2023). Complementing this, the SRMR = .06 and the Comparative Fit Index (CFI) = .94, both suggesting a good fit (Schermelleh-Engel et al., 2003). The Cronbach's α coefficients for each dimension were .83, .82, .83, and .89 separately, and the overall EI's Cronbach's α coefficient was .92. These results verified this scale's internal consistency and its structural validity, thus validating the use of the four-factor EI model in

further analyses within this research. The table 3.8 below presents the model fit indices and factor loadings:

Table 3.8

CFA - EI Results

	$\chi 2[df = 98]$	χ^2/df	SRMR	RMSEA	CFI
Model Fit Indices	162.98**	1.66	.06	.08	.94
	SEA	OEA	UOE	ROE	
Factor Loadings	.62 -.84	.55 -.81	.67 -.78	.81 -.84	
Cronbach's α	.83**	.83**	.82**	.89**	

Note: $^{*}p < .05$, $^{**}p < .01$.

CFA - Career Adaptability

In Study 3, a similar approach was used for career adaptability to reduce the number of items in the subsequent analysis. I use four indicators to represent the four dimensions of career adaptability. The overall career adaptability scale demonstrated high reliability (α = .89). Figure 3-2 exhibits the factor loadings for the four distinct dimensions of career adaptability — career concern, career control, career curiosity, and career confidence — and found strong associations with their respective factors, with loadings ranging from .54 to .88.

Table 3-9 presents the results of CFA conducted on the career adaptability construct; the model fit indices indicated a satisfactory model fit. The chi-square value of 331.92 with 183 degrees of freedom results in a χ2/df ratio of 1.81, suggesting a good fit to the observed data, considering that values below three are typically acceptable (Schermelleh-Engel et al., 2003). The SRMR value of .05 is well within the preferred range, indicating a close fit between the hypothesised model and the observed data (Hu & Bentler, 1999). Although the RMSEA is at the upper boundary of acceptability at .08, it does not exceed the threshold that would indicate a poor fit. The CFI of .92, while slightly below the ideal of .95, still denotes a good fit overall (Hu & Bentler, 1998). The Cronbach's α value of each dimension ranged

from .79 to .92, indicating a high level of internal consistency. These findings verified the construct's multidimensionality and validated the use of this career adaptability measure in this research.

Figure 3.2

CFA-Career Adaptability Results

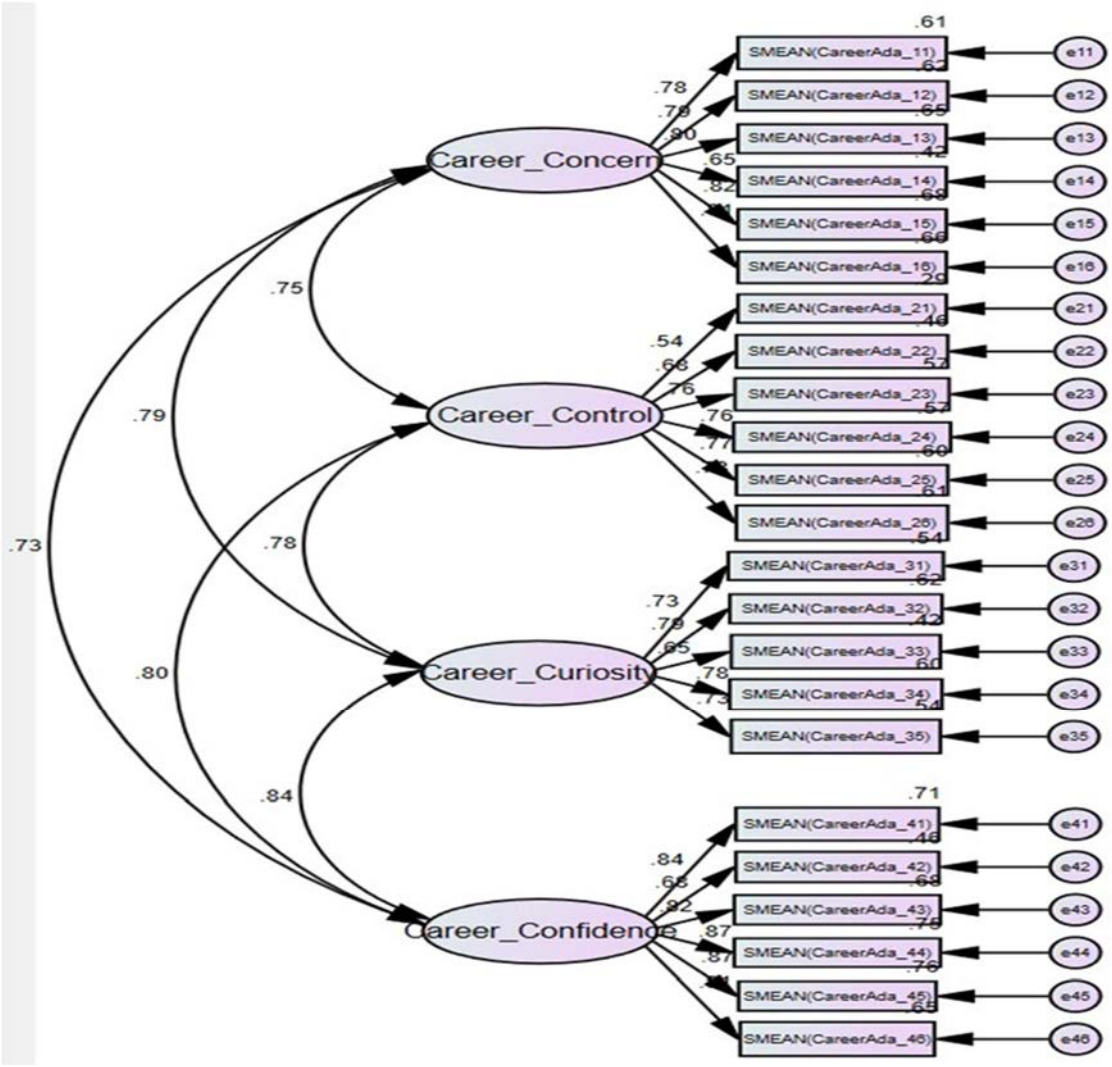


Table 3.9

CFA – Career Adaptability Results

	$\chi 2[df = 183]$	χ^2/df	SRMR	RMSEA	CFI
Model Fit Indices	331.92**	1.81	.05	.08	.92
	Career Concern	Career Control	Career Curiosity	Career Confidence	
Factor Loadings	.63 -.83	.54 -.78	.65 -.79	.80 -.88	
Cronbach's α	.90**	.86**	.79**	.92**	

Note: $^{*}p < .05$, $^{**}p < .01$.

Control for Bias - Socially Desirable

Since most of the measurements used in this research are self-report scales, and especially because safety performance is being evaluated, this may increase the risk of social desirability bias. That is, the participants may provide responses that reflect how they want to be perceived rather than their actual behaviour or attitudes. To address this potential concern, Hays et al.'s (1989) 5-item social desirability scale was employed to assess social desirability. The Cronbach's α for social desirability was .63, which is below the generally accepted threshold of .70 indicating lower internal consistency, which suggests that the scale may not fully capture the extent of social desirability bias present in the data. While this limitation is acknowledged, the scale was retained as it provides a basic level of assessment for social desirability. Future research should consider additional or alternative methods to control for social desirability bias, such as including it as a covariate in regression models or employing more advanced techniques like randomized response methods (De Jong et al., 2010).

SEM Results - Study 1

Study 1 Model EI-Situational Awareness-Safety Performance

The following section provides a detailed explanation of the data analysis conducted for Study 1. Studies 2 and 3 follow a similar approach and will not be repeated here.

Figure 3.3

SEM Model (EI-Situational Awareness-Safety Performance)

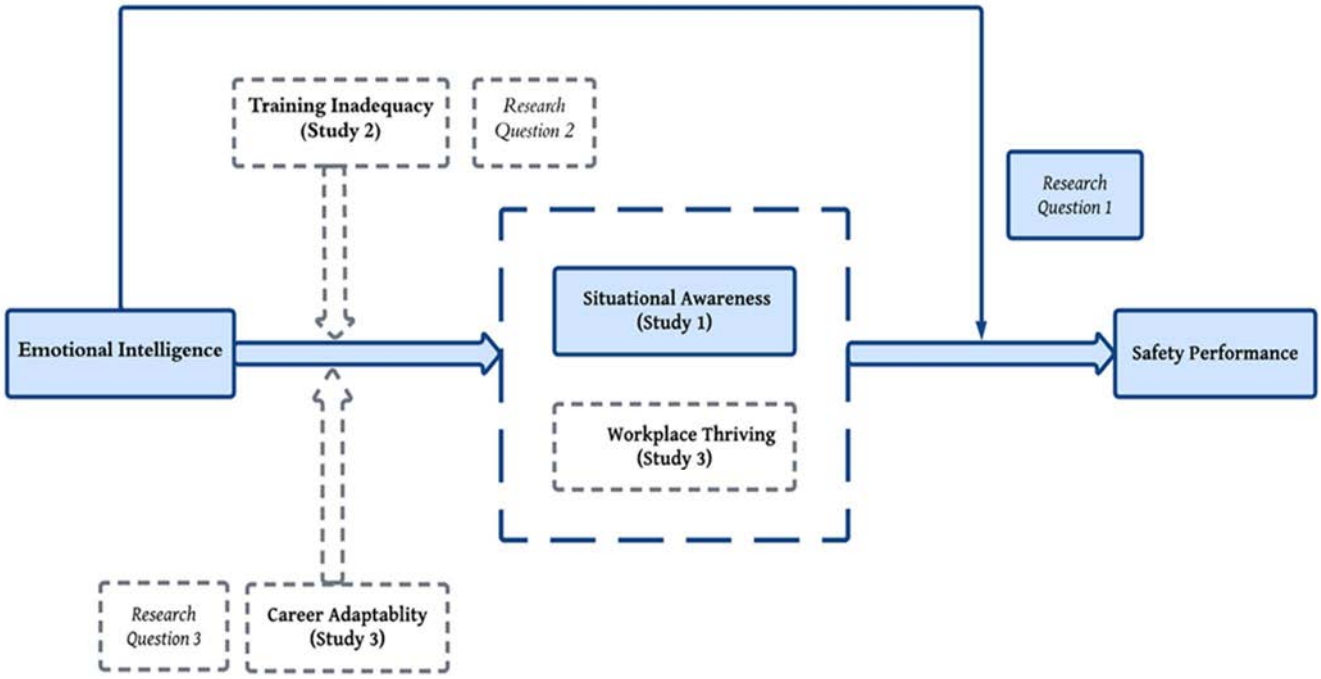
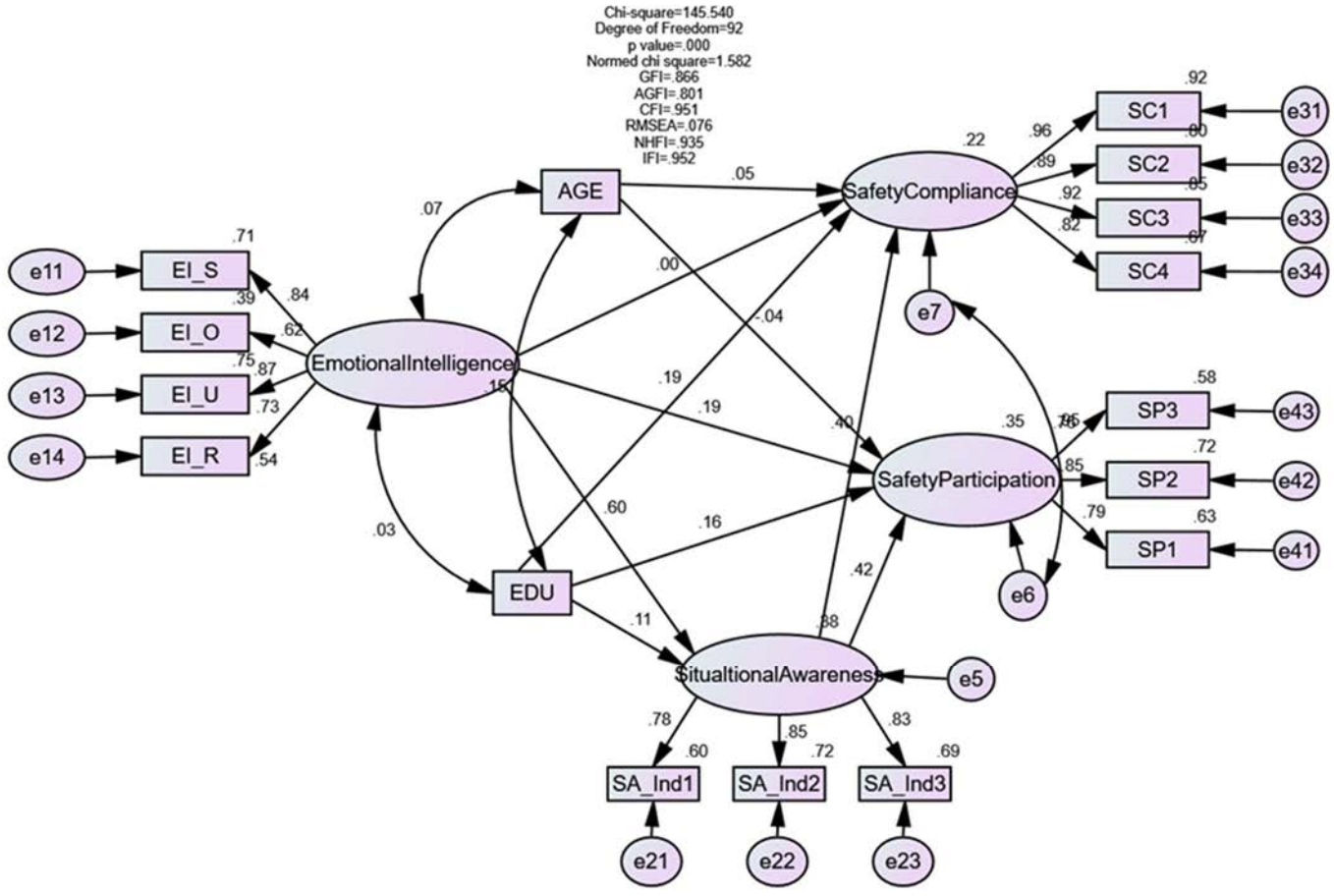


Figure 3-3 presents the meditation moderating mode of Study 1, including EI (the independent variable), safety performance (the dependent variable), and situational awareness (the mediator). The hypotheses were first examined using SEM to confirm the mediating model. As Figure 3-4 shows, EI is a central latent variable, comprising four indicators: SEA, OEA, UOE, and ROE, with factor loadings ranging from .54 to .87, indicating a substantial contribution of each indicator to the EI construct. The model examines the direct paths from EI to two aspects of safety performance: safety compliance and safety participation. Safety compliance is assessed through four items (SC1-SC4), all showing strong loadings above .82, indicating a high level of consistency within this construct. Similarly, safety participation is

represented by three items (SP1-SP3), with factor loadings between .58 and .85, which suggest a reliable measure of this safety performance aspect. Situational awareness mediates the relationship between EI and the two dimensions of safety performance and is indicated by three parcels (SA_Ind1, SA_Ind2, SA_Ind3), with factor loadings from .69 to .88, highlighting the situational awareness measure in capturing the construct's essence. Demographic variables, such as age and education (EDU), are also included in the model to control their potential influence on safety performance. The path coefficients from age and EDU to the safety performance constructs are relatively small, suggesting that there may be some negligible influence.

Figure 3.4

SEM_EI-SA-SP



Model fit indices are reported at the top of the diagram, with a chi-square value of 154.540, RMSEA of .036, and CFI of .951, among others. These indices indicate a good fit for the model, with values falling within acceptable ranges for RMSEA (less than .08) and CFI (greater than .90), indicating that the model adequately captures the data's structure. Overall, the results support the hypothesised relationships within the research framework, highlighting the role of EI in predicting safety performance through the mediator of situational awareness.

Finally, Model 74 in Hayes' (2013) PROCESS macro was used to examine two moderated mediation paths separately based on 5000 bootstrap samples. The details of this process are presented in Chapter 5 (Study 1).

Ethical Considerations for Research Participation

Before conducting this research, the following ethical considerations have been integrated into the research design and implementation stage.

Informed Consent

Potential participants received a detailed briefing via an information sheet attached to the questionnaire, outlining the study's objectives, methodologies, potential risks, and expected benefits. We ensured that consent was informed and voluntary, emphasising that participation would not affect their current or future professional standing or relationships. Additionally, participants were informed about their right to withdraw from the study at any stage without any negative consequences, a principle consistently emphasised throughout the study.

Anonymity and Confidentiality

To protect participants' privacy, participants were instructed to create a unique code using a combination of letters and numbers, which eliminated the need for personal identifiers in the surveys. This approach ensured all collected data was anonymised; no

personal identifiers were included in the datasets. Furthermore, survey responses were treated with strict confidentiality, data confidentiality was strictly maintained, and access to the data was limited to the research team.

Ethical Approval

The research proposal, including the ethical considerations, information sheet, consent forms, and methodologies for data collection, was reviewed and approved by the JCU Human Research Ethics Committee (Approval No: H6823). This approval affirmed the study's adherence to the ethical standards required for research involving human participants.

Limitations and Suggestions

It is important to acknowledge the limitations of this research that may have an effect on the generalisability of the findings. Firstly, as the study focused specifically on pilot trainees and commercial pilots in the Chinese commercial aviation sector, and considering the limited profession mobility for this group mentioned before, caution should be exercised when extending the results to other cultural settings or geographical contexts. It may be worth replicating the study across various cultures and regions as it would contribute to the external validity of the findings. The aviation industry operates under various regulatory frameworks, safety protocols, and cultural contexts worldwide so replicating the study in other countries can help verify the findings if those in the Chinese commercial aviation industry are consistent with those operating under different aviation authorities and cultural settings. Indeed, if replicated studies yield consistent results, policymakers and operators can be more confident in applying the research findings to refine training that aims to improve pilots' EI and safety performance globally.

Secondly, the research relied on self-report measures, which may introduce biases such as social desirability. Future studies could incorporate objective performance measures or utilise multi-source feedback to gather more comprehensive and reliable data. For

example, using official pilots' safety records, or gathering assessments from flight instructors or co-pilots, can provide a more accurate assessment of a pilot's safety performance and behaviours. Utilising technology to track physiological responses, such as heart rate variability or eye movements, during simulations or actual flights can provide objective data on a pilot's stress levels and situational responsiveness.

Lastly, the study was conducted using a quantitative method, which limits the ability to establish causal relationships. Longitudinal studies that follow participants over an extended period would reduce biases present in cross-sectional surveys and provide more robust evidence on the long-term effects of EI on safety performance. Combining both qualitative and quantitative methods can offer a more complete view and mitigate the limitations inherent in self-reported measures.

In conclusion, this chapter has provided an overview of the research methodology employed in investigating the influence of EI on pilots' safety performance. The research design, target group, data collection methods, theoretical frameworks, and the research process have been outlined. While acknowledging certain limitations, this study aims to contribute to the understanding of the relationship between EI and safety performance in the workplace. The subsequent chapters will delve into the analysis and interpretation of the data, providing valuable insights for both academia and the aviation industry.

Chapter 4

Emotional Intelligence and Safety Performance at Work: A Moderated Mediation Model of Situational Awareness

This chapter investigates the predictive role of EI on individuals' safety performance within the commercial aviation sector. It aims to develop and test a theoretical model (illustrated in Figure 4.1) that explores the direct influence of EI on safety performance, the mediating effect of situational awareness on the relationship between EI and safety performance, and the moderating role of EI in the relationship between situational awareness and safety performance.

To address the research objectives, the study involved the participation of 117 pilot trainees from two distinct flight training schools. A two-wave survey approach was conducted to collect data, allowing for a comprehensive analysis of the proposed model. The research aims to provide valuable insights into the mechanisms through which EI influences safety performance and identify the conditions under which these relationships are most pronounced.

The results of the study revealed several important findings. Firstly, it was found that EI has a significant impact on individuals' situational awareness in the workplace. Higher levels of EI were associated with improved situational awareness which, in turn, positively influenced safety performance. This highlights the crucial role of EI in enhancing individuals' ability to accurately perceive and interpret their work environment, enabling them to effectively respond to safety-related challenges.

Furthermore, the study identified the moderating role of EI in the relationship between situational awareness and safety performance. Specifically, the effect of situational awareness on safety performance was found to be stronger in individuals with lower levels of EI. This suggests that individuals with lower EI can particularly benefit from developing situational awareness skills to compensate for their lower emotional competencies.

Additionally, the study suggested that for individuals with lower EI, the effects of EI on safety performance were more likely to be mediated by situational awareness. This implies

that situational awareness plays a critical role in translating the benefits of EI into tangible safety performance outcomes for individuals with lower emotional competencies.

Overall, this chapter lays the groundwork for the detailed discussion on methodology, empirical findings, and implications that follow. Through an analysis of the interplay between EI, situational awareness, and safety performance, this research seeks to deepen our understanding of the determinants of safety-related behaviour in the aviation workplace.

Introduction

Safety performance is an important employee outcome valued by organisations. It is defined as 'safety-related behaviours' and consists of two components: safety compliance and safety participation (Griffin & Neal, 2000). Employees' safety behaviours can generate benefits for both the organisation and the employee (such as good safety records, lower costs, and fewer human injuries), while unsafe behaviours can cause serious consequences, such as poor safety records, a poorer reputation, and human injuries (Beus et al., 2016; Zacharatos et al., 2005). Accordingly, researchers have explored various antecedents that can enhance safety performance, including safety leadership (Clarke, 2013; Griffin & Hu, 2013), safety climate (Griffin & Neal, 2000; Neal & Griffin, 2002, 2006), work characteristics (Turner et al., 2012), and safety-related training (Burke et al., 2011; Yorio & Wachter, 2014).

While this line of research has significantly contributed to our understanding of what can foster safety performance, one critical element that has been neglected in existing safety research is emotional competence. Research suggests that, in general, emotional fluctuation, if not properly controlled, can lead to employees' poor management of tasks (Mayer et al., 1990; Thompson, 1994). Such outcomes can be critical in situations where safety-centred activities are a core part of the work. For example, when a task requires that employees pay attention to safety, ill-managed emotions might distract their attention from this task and result in unsafe actions in the workplace. To advance this field, we investigated the

determinants of safety performance from the perspective of EI, which is a typical type of emotional competence. EI is defined as one's "ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth" (Mayer & Salovey, 1997b, p. 10).

It is proposed that higher levels of EI will lead to improved safety performance. This proposition is based on the theoretical viewpoint that EI is a set of interrelated emotional skills that can be used to guide one's job-related activities and performance (Mayer et al., 2016; Mayer et al., 1997; Wong & Law, 2002). Given that safety performance is an essential aspect of work performance in many contexts (Griffin & Neal, 2000), this viewpoint suggests that EI may also be able to direct individuals towards safety-related behaviour when they are performing job tasks. The current study examines the mechanisms underlying the relationship between EI and safety performance by testing the mediating effect of situational awareness. Situational awareness refers to "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Endsley, 1988, p. 97). It was chosen as the mediation mechanism because, theoretically, EI facilitates individuals in perceiving and judging what is happening in their work environments (Izard, 2010; Mayer et al., 2016) as well as in dealing with situational and emotional demands and pressures (Bar-On, 1997). Indeed, individuals with high EI exhibit improved perception and understanding of emotional cues, allowing for a comprehensive interpretation of situational dynamics critical for safety. Additionally, they possess superior emotion regulation skills, maintaining cognitive clarity and focus under stress, which is vital for maintaining situational awareness in challenging environments (Mayer et al., 2016). Individuals with higher EI levels integrate emotional information with cognitive processes, enhancing their anticipatory abilities and responsiveness to

environmental changes. This integration facilitates not only individual decision-making but also improves collective situational awareness through effective social interactions and communication within teams. Meanwhile, situational awareness reflects interactions between one's mindset and the dynamic changes of one's associated contexts, and thus it is conceptually critical in driving individuals to make safety-related decisions (Endsley, 2015c; Stanton et al., 2001). On this basis, we argue that EI can positively impact individuals' safety performance via situational awareness.

To extend this mediation framework, this research also explores whether and how EI can be a boundary condition for the relationship between situational awareness and safety performance. We consider the moderating role of EI because it has been argued that the ability of, and/or disposition towards, staying emotionally positive (e.g., calm and active) tends to diversify employees' reliance on perceptions and awareness of the job context that drive work behaviours. This suggests that EI can shape the extent to which employees leverage their understanding of the job context in guiding their actions. In line with this view is the idea that, although compliance with and participation in safe behaviours always requires an individual to be aware of the associated contexts, the extent to which individuals rely on this awareness to perform safety-related activities may be conditional on emotional capabilities (e.g., EI). For example, an individual with high EI may be proficient in interpreting emotional cues in the workplace, which leads them to adapt their safety behaviours more effectively based on their understanding of the context. This could mean recognising subtle signs of stress or fatigue in themselves or others that may compromise safety and responding proactively to mitigate risks. By integrating mediation and moderation, we further investigate how the entire mediation process may vary with levels of EI.

In summary, the present research tests a moderated mediation model (Figure 4.1) to reveal the mechanism underlying the linkage between EI and safety performance.

Figure 4.1

Research Model-Study 1

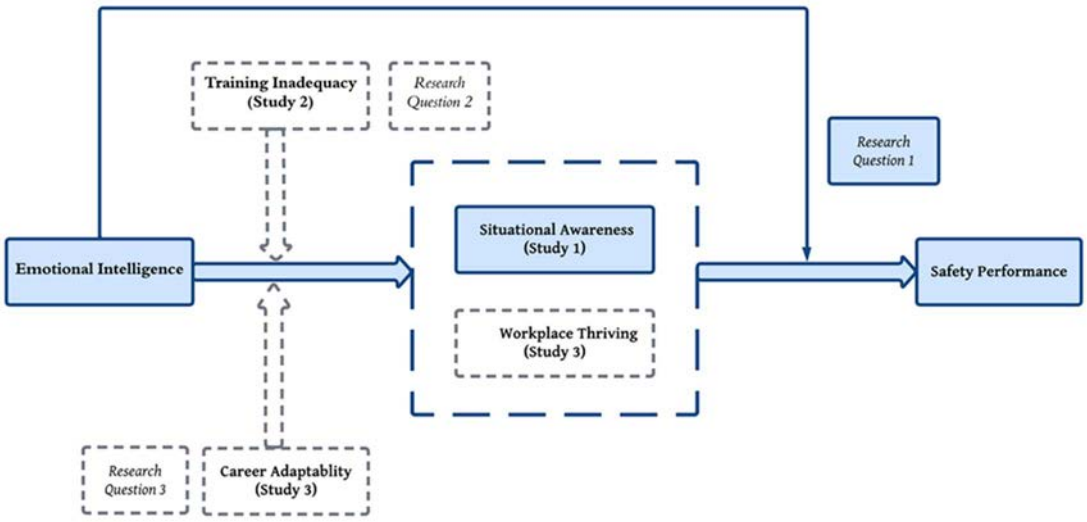


Figure 4.1 shows that situational awareness mediates the relationship between EI and safety performance, and that the mediating effect is also moderated by EI. The following section explains how the associated hypotheses were developed.

Theoretical Background and Hypothesis Development

EI and Safety Performance

According to (Mayer & Salovey, 1997b), EI consists of four core elements: a) perceiving emotions; b) facilitating thought by using emotions; c) understanding emotions; and d) managing emotions in oneself and others (Mayer & Geher, 1996). These mental abilities connecting intelligence and emotion reflect individual differences in applying emotion-related skills to solve problems. Consistent with this view, Wong and Law (2002) further defined EI as the combination of four dimensions branches: a) self-emotion appraisal (SEA); b) others' emotion appraisal (OEA); c) regulation of emotion (ROE); and d) use of emotion (UOE). Specifically, SEA refers to the individual's ability to recognise their internal feelings and express these feelings accurately. OEA denotes the individual's ability to correctly understand the feelings of others. ROE reflects the individual's ability to

consciously regulate their emotions to function adequately in different situations. UOE describes the individual's ability to use their emotional knowledge to guide their activities and performance.

Wong and Law's theoretical framework shows the interior hierarchal structure of EI, in which four dimensions jointly function to shape EI, and thus the actual problem-solving abilities and direct adaptive behaviours in work and daily life. Therefore, in line with prior studies (e.g., Wong and Law (2002); Jiang (2016)), we focus on the broad construct of EI instead of each of its dimensions.

We expect that EI has an influence on individuals' safety performance. Employees' safety performance, as a specific aspect of work performance, has been a primary focus of safety-related research because it contributes to an organisation's potential to ensure workplace safety (Neal & Griffin, 2006). Based on the work performance theories of and Borman and Motowidlo (1993), Griffin and Neal (2000) proposed that safety performance is a construct consisting of safety compliance and safety participation, which indeed reflects task performance and contextual performance, respectively. While safety compliance involves employees' behaviour in relation to the core safety-related substantive duties that need to be carried out to maintain workplace safety, safety participation refers to employees' engagement in the voluntary activities that help improve workplace safety (Neal et al., 2000). For example, in an aviation context, this could include pilots conducting thorough pre-flight checks, adhering to air traffic control instructions, and following emergency procedures accurately. These behaviours are mandatory aspects of a pilot's role, ensuring that safety standards are met consistently. On the other hand, pilots participating in safety training sessions not required by their role, such as sharing insights from past flights with colleagues to improve collective safety awareness, or contributing to safety meetings with suggestions

for improvements, while not directly part of their core duties, play a crucial role in fostering a proactive safety environment, encouraging a culture of continuous safety improvement.

As mentioned earlier, substantial empirical research has established that EI is an important predictor of work performance (Day & Carroll, 2004; Farh et al., 2012; Jr et al., 2011; Van Rooy & Viswesvaran, 2004). Research has shown that employees with high EI usually receive higher work performance ratings, establish favourable interpersonal relationships, and report higher job satisfaction (Jordan & Troth, 2011; Jr et al., 2011; Sy et al., 2006). For example, individuals with stronger emotional competence can interpret the implied information from perceived colleagues' emotions (e.g., goals, attitudes, and intentions) and convert such information into useful resources to assist in decision-making and action-taking, which in turn can enhance work performance (Law et al., 2004).

Indeed, empirical research on the relationship between EI and task performance (Jr et al., 2011; Schutte & Loi, 2014) indicates that EI can promote the internal motivation to enhance in-role performance (Law et al., 2008). We thus predict that individuals with higher levels of EI are more likely to adhere to compulsory safety responsibilities such as following safety policies, learning safety procedures, and wearing personal protective equipment. In addition, there is evidence that emotionally intelligent individuals are more likely to participate in work-related voluntary activities to contribute their support because they are aware that this can benefit both themselves and the organisation. On these grounds, we also expect that those with higher levels of EI have a greater tendency to engage voluntarily in activities that contribute to workplace safety, such as actively participating in safety training sessions, offering suggestions for safety improvements, and taking the initiative to address potential safety hazards before they escalate. Taken together, these points lead us to hypothesise that EI has a positive influence on both safety compliance and safety participation.

Hypothesis 1: EI is positively related to safety compliance (H1a) and safety participation (H1b).

The Mediating Role of Situational Awareness

We propose that EI may influence safety performance through its influence on an individual's situational awareness. As stated earlier, situational awareness is considered a mediator because EI can direct people to attend to different situations, in which they may need to deal with emotional challenges to focus on work. Endsley (1995c) defines situational awareness as a state of knowledge that results from ongoing information processing in dynamic work circumstances and comprises three hierarchical levels. According to this three-level structure, individuals first gather information regarding the workplace such as status, attributes, and changes. Secondly, with the information thus gathered, individuals understand and internalise the cues, objects, and events in their surroundings. Thirdly, based on the acquisition and understanding of such information, individuals can then predict the outcome of the situation. These three levels constitute a knowledge-driven process which forms the cornerstone of decision-making and assists in determining what problem-solving strategies will be applied (Endsley, 1999b). Next, we will theorise the relationship between EI and situational awareness and then elaborate on the relationship between situational awareness and safety performance.

In the workplace, emotional interactions among employees are complicated (Ashkanasy & Humphrey, 2011). In general, EI may direct individuals to actively manage these emotional situations so as to be mentally or psychologically functional. For example, EI helps individuals properly address and manage negative emotions, such as distress, which can usually impair their abilities to comprehend and respond to situational cues critically involved in decision-making and action-taking processes (Loewenstein & Lerner, 2003). Moreover, EI facilitates individuals in maintaining situational awareness by enabling individuals to remain

aware of their environment, even in emotionally-charged situations. This capacity for emotional regulation and awareness is supported by findings from studies like that of Lopes et al. (2003), which demonstrate that those with higher levels of EI are more likely to appraise the attributes of their interpersonal networks and self-regulate their mindsets toward these attributes, and they therefore perceive a better quality of social relationships.

Further, EI can contribute to shaping the three levels of situational awareness. First, emotional competencies such as EI enable individuals to derive valuable information from changes in another's emotions and in the environment (Izard, 2010). In the workplace, high EI drives employees to process information that is relevant to the situations under which they engage in work activities. This information processing can help to establish the first level of situational awareness (i.e., perception of the elements of the environment). For instance, a person with higher levels of EI is more sensitive to others' emotions and can read nonverbal cues such as facial expressions and body language (Mayer et al., 2011). Second, in addition to this role characterised by the sensitivity to and intake of contextual information, Mayer et al. (2011) also highlighted that EI guides individuals to better understand the information existing in their environment (e.g., the tone with which a person speaks). Such a function of EI is likely to shape the second level of situational awareness, which requires an understanding of environmental cues (Sætrevik, 2013). Third, since EI can foster rational thinking and information processing (e.g., Emmerling and Cherniss (2003)), it may also direct individuals' attention toward the elements of the situation that benefit individual functioning. For example, scholars suggest that EI guides people to distribute their attention and helps them to maintain an optimistic view by eliminating the negative impacts caused by adverse emotions or unfavourable affective events or situations (Law et al., 2008). This function of EI may reduce obstacles associated with the third level of situational awareness,

in which individuals are expected to undertake a rational appraisal and prediction of the outcome of the situation (Emmerling & Cherniss, 2003; Endsley, 1995c; Sætrevik, 2013).

Moreover, the role of EI in shaping situational awareness may also be explained in terms of its ability to alleviate stress, which exists in many work situations (Endsley, 2015b; Nikolaou & Tsaousis, 2002). Stress is an important inhibitor of situational awareness (Endsley, 2019), as stressors (e.g., workload, time pressures, and complexity) exhaust individuals' mental energy and distract them from the core part of the work context. For instance, individuals overloaded with stress have increased mental burdens, which can lead to poor situational awareness (Endsley, 2015b). EI, particularly its emotional regulatory component, is an effective internal state management competence that enables a fast recovery, helps an individual reach a calm state, and allows them to continue with constructive activities. As Gross (1998) asserted, EI-related skills redirect individuals to the most essential parts of the task even after short interruptions and therefore ensure that their limited mental capacity is focused on the critical things, such as collecting the core information, making decisions, and taking actions in complex situations. Consistent with these arguments, empirical research has found that individuals with high levels of EI demonstrate stronger abilities in understanding and adapting to stressful events and coping with negative contextual/situational influences (Mikolajczak & Luminet, 2008). From the above, we predict that EI has a positive relationship with situational awareness.

Hypothesis 2: EI is positively related to situational awareness.

We now continue to theorise the relationship between situational awareness and safety performance. Poor performance might be observed in those individuals with poor situational awareness (e.g., when situational awareness is inaccurate or lost). For instance, Endsley and Robertson (2000) found that higher performing pilots are shaped not only by their effective task-management skills and proactive coping strategies for stressful

circumstances, but also by their situational awareness. They underscored that high performance is cultivated through effectively gathering information from the work environment (e.g., feedback from colleagues and changes in the situation), actively interpreting the meaning of the contextual elements, and efficiently anticipating the possible risks. All of these aspects contribute to establishing and maintaining high levels of situational awareness (Endsley, 2019). Conversely, poor performance usually results from passively accepting information, missing cues, or neglecting potential risks, which lead to insufficient, or even loss of, situational awareness (Durso & Sethumadhavan, 2008). This line of literature indicates that in general, poor situational awareness tends to harm individual performance (Endsley, 2015b; Endsley et al., 2000).

This tendency is likely to exist when safety performance is considered. Without sufficient situational awareness, individuals might not be able to correct erroneous behaviours that may cause risky or unsafe actions (Endsley, 2000). In other words, in safety-related contexts, poor situational awareness may not equip individuals with key contextual knowledge, making them less effective when performing tasks. Indeed, Griffin and Neal (2000) identified safety-related knowledge as an important determinant of safety performance. They indicated that knowledge of safety components of the work environment is a key factor that drives individuals' safety behaviours. Christian et al. (2009) reported that safety knowledge of the situation significantly enhances both safety compliance and safety participation. Given that high situational awareness involves the knowledge of a given situation, it should also foster safety behaviours (e.g., compliance and participation). Past research supports this view. For example, Stanton et al. (2001) found that poor situational awareness leads to failures in recognising vital contextual information and to misunderstanding the meaning of this information, thus likely resulting in inappropriate ways of performing tasks, which may incur serious consequences such as accidents. Other research

has also revealed that higher situational awareness is more likely to benefit safety outcomes by reducing unsafe behaviours, mistakes, and accidents (Endsley, 2019; Fernandes & Braarud, 2015). Therefore, we propose a positive linkage between situational awareness and safety performance behaviours.

Hypothesis 3: Situational awareness is positively related to safety compliance (H3a) and safety participation (H3b).

The above theoretical discussion and empirical findings suggest a potentially positive relationship between EI and situational awareness as well as a positive relationship between situational awareness and safety performance. In fact, a pilot with high EI can recognise signs of stress in a colleague, and consider it a potential safety hazard. This enhanced situational awareness not only helps them identify potential safety risks but also leads to proactive engagement in safety-related activities, such as reporting issues or suggesting improvements, directly contributing to safety performance. Taken together, the above points lead us to expect that situational awareness serves as a mediation mechanism in the effect of EI on safety performance (i.e., safety compliance and safety participation).

Hypothesis 4: Situational awareness mediates the relationships between EI and safety compliance (H4a) and safety participation (H4b).

EI as a Moderator

Although it appears that the positive relationship between situational awareness and safety performance is established, we argue that the magnitude of this relationship may vary with individuals' EI. Previous research indicates that EI is a motivating resource that drives individuals' thinking and actions by directing attention to important information about the environment and that it helps enhance work performance by helping workers cope with stress arising from dynamic environments (Miao et al., 2017). This role of EI implies that individuals with high levels and those with low levels of EI may differ in their needs for other

internal or external resources to self-motivate in task or behavioural contexts (Jordan et al., 2002).

As previous discussed, emotionally-intelligent individuals are more effective in solving problems in the workplace and exhibit greater resilience when dealing with stressful, emotional, risky, and unsafe situations. They tend to be highly self-functional and self-efficient, for EI serves as a strong psychological force that motivates them to achieve task goals and create/maintain a positive context of the task (Wong & Law, 2002). As shown in prior research (e.g., T. Cheng et al., 2012; Gao et al., 2013), the tendency that high EI shapes individuals' positive attitudinal and behavioural outcomes remain relatively stable, regardless of their reflections of the associated environment. The implication is that high-EI individuals would be naturally committed to better task (e.g., safety compliance) and contextual (e.g., safety participation) performance. With this natural tendency, they might not have a strong need for this knowledge or awareness, although as an additional motivating factor, knowledge of the situation/context (e.g., situational awareness) may still facilitate them in improving performance (Wong & Law, 2002).

In contrast, for individuals with lower levels of EI, situational awareness should be more critical. In general, they tend to be less self-efficient in performing tasks, particularly when these tasks have special or demanding requirements (e.g., safety to be ensured) (Wiegand, 2007). This deficiency may be due to low-EI individuals being less tolerant of ambiguous, emotional, and risky situations. To effectively function in complying with safety procedures and engaging in extra roles in which they voluntarily participate in safety-promoting activities, they may need to better understand their associated context/situation so as to facilitate their safety-related tasks. Therefore, situational awareness or knowledge may serve as a trigger that helps individuals with low levels of EI to be more effective in enhancing or maintaining safety compliance and participation. Though we have found no

direct empirical evidence, some research suggests that, as EI increases, cognitive abilities that help acquire knowledge or form awareness of the situation tend to matter less in influencing work performance (Cote & Miners, 2006). Based on this line of reasoning, we propose that the positive effect of situational awareness on safety compliance and safety participation weakens as EI increases.

Hypothesis 5: EI moderates the relationship between situational awareness and safety compliance (H5a) and safety participation (H5b), such that these relationships are stronger when EI is low rather than high.

The Moderated Mediation

According to Hayes (2015), a moderator in any phase of the mediation might drive the indirect effect to differ across low and high levels of this moderator. Considering that EI may potentially moderate the relationship between situational awareness and safety performance, the indirect effect of EI on safety performance via situational awareness may be different across low and high levels of EI. As stated earlier, high-EI individuals, relative to their low-EI counterparts, may be less likely to rely on situational awareness when performing safety-related activities. Combining both the mediation and the moderation effects, we expect that for low-EI individuals, the effects of EI on safety compliance and safety participation are more likely to be mediated by situational awareness.

Hypothesis 6: The indirect effects of EI on safety compliance (H6a) and safety participation (H6b) via situational awareness are stronger for individuals with low rather than high levels of EI.

Methods

Participants and Procedure

Data was collected from full-time pilot trainees at two flight training schools in mainland China at two different time points via online or paper questionnaires (School A and

School B). These trainees were employed by an airline company in China. Upon completion of their training, the trainees would serve in that company as commercial airline pilots after completing their intensive training. This sample is representative of occupations that require a special emphasis on safety performance. Ethical approval for this project was obtained from the JCU Human Research Ethics Committee (application ID H6823). In School A, potential respondents were sent invitations containing a hyperlink to the online survey by their instructors. In School B, potential respondents received envelopes containing the questionnaires; they were instructed to seal the completed questionnaires in the envelopes and return them to researchers and assistants. The information sheet, which was included as the first section of the survey, informed respondents that participation in this study was completely voluntary, anonymous, and confidential. Voluntary participants then completed the entire questionnaire.

The Time 1 survey was distributed to 268 potential participants, and 168 surveys were returned (response rate of 62.69%). The Time 2 survey was administered to Time 1 respondents, and 142 responded (response rate of 84.52%). In total, we successfully matched usable questionnaires for 117 participants. Among these trainees, 95.73% (n = 112) were male. As for their ages, 87.18% (n = 102) were 19–25 years old; 11.11% (n = 13) were 26–30 years old; and 1.71% (n = 2) were 31–49 years old. As for education, 17.09% (n = 20) reported a high school level of education; 1.71 % (n = 2) held tertiary diplomas; 75.21% (n = 88) held bachelor's degrees; and 5.99% (n = 7) had postgraduate qualifications.

Measures

Measurement items were rated on a five-point Likert-type response scale ranging from strongly disagree (1) to strongly agree (5). This scale type is commonly used in research to measure attitudes, perceptions, and agreement levels.

EI. EI was measured using the Wong and Law Emotional Intelligence Scale (WLEIS) scale which contains 16 items that assess four dimensions of EI in terms of SEA (four items; e.g., "I have a good sense of why I have certain feelings most of the time"), OEA (four items; e.g., "I always know my friends' emotions from their behaviour"), UOE (four items; e.g., "I always set goals for myself and then try my best to achieve them"), and ROE (four items; e.g., "I am able to control my temper and handle difficulties rationally"). The main reasons we chose this measure were that this scale was initially developed from a sample of Chinese employees, and that its high reliability has been verified in numerous empirical examinations in Chinese contexts (e.g., Law et al., 2008), the focal setting of our research. Also, this self-reporting approach for measuring EI has shown high test-retest reliability among different groups, e.g., university students, teachers, and salespeople (Wong et al., 2004, 2010).

CFA was conducted to test the dimensionality of this 16-item scale. Results show a good fit for the four-factor EI model ($\chi 2[df = 98] = 162.98$, $p < .001$, $\chi^2/df = 1.66$, SRMR = .06, RMSEA = .08, CFI = .94). Standardised factor loadings for all items were above .55 (a range of .55–.91) and statistically significant ($p < .001$). The Cronbach's α were .83, .83, .82, and .89 for SEA, OEA, UOE and ROE, respectively. Since the focus is on overall EI, the mean of the 16 item scores was used in the data analysis. The overall EI scale demonstrated high reliability ($\alpha = .92$).

Situational awareness. Situational awareness was measured with 13 items developed by Sætrevik (2013). These items were used to measure three levels of situational awareness: four items were related to perception of safety issues (Level 1) (e.g., "I sometimes lose track of information relevant for maintaining safety in my work"); five items were linked to comprehending the safety situation (Level 2) (e.g., "I know which information is relevant for safety and which information is not relevant for safety"); and four items were related to

forecasting the safety situation in the near future (Level 3) (e.g., “I notice when an unsafe situation is about to arise at my workplace”). The overall Cronbach’s α for situational awareness was .84.

Safety performance. Safety performance was measured with Griffin and Neal’s (2000a) seven-item scale. This scale has been widely used to assess safety-related work performance across many industries (Beus et al., 2016). Four items measured safety compliance (α = .93; e.g., “I carry out work in a safe manner”); and three items measured safety participation (α = .83; e.g., “I put in extra effort to improve the safety of the workplace”).

Control variables. The control variables included in the data analysis were age, gender, and education. Based on the specific circumstances and the implications of previous research, these variables may influence safety performance and situational awareness (Endsley & Robertson, 2000).

Data Analysis

Prior to testing the hypotheses, CFA was used to examine the measurement model. Since inflated measurement errors increase when a single latent construct has too many indicators (e.g., 13 items for situational awareness), we followed prior researchers (e.g., Lin et al., 2012; Liu et al., 2017) and used an item parcelling strategy to create parcelled indicators for EI and situational awareness. We used the four dimensions of EI as its indicators in CFA and created three parcels for situational awareness by allocating items with the highest and lowest factor loadings to different parcels successively. The mean score for all items in the same parcel was employed as the score of the corresponding parcelled indicator.

The hypotheses were tested based on hierarchical regression analyses in SPSS. This approach was combined with Hayes (2013) PROCESS macro for testing the moderated

mediation. Model 74 in Hayes' PROCESS is configured as a mediated relation with also a moderation role of the predictor in the second stage of this mediation. This method has been widely used to test moderated mediation models in which the predictor is also a moderator (e.g., Kim & Kochanska, 2017) and is noted for generating more accurate and reliable results by setting bootstrap samples (Valeri & VanderWeele, 2013). In the present study, EI was both the predictor and the moderator for the relationship between situational awareness (the mediator) and safety performance (the dependent variable) (see Figure 4.1).

Results

The Measurement Model

CFA was conducted to compare the four-factor model with a single-factor, two-factor, and three-factor models. The CFA results are shown in Table 4.1.

Table 4.1 shows that the fit indexes demonstrated that the four-factor model fits the data best, confirming the good validity of the constructs used in this study. All factor loadings were above 0.64 (ranging from 0.64 to 0.93, $p < .001$), suggesting that the indicators sufficiently represented their corresponding constructs. Therefore, the four focal variables (i.e., EI, situational awareness, safety compliance, and safety participation) should be examined as separate constructs.

Table 4.1

CFA Results

Models	χ^2	*df*	$\Delta\chi^2$	Δdf	χ^2/df	SRMR	RMSEA	CFI
4-factor model	113.78***	71	---	---	1.60	0.06	0.07	0.96
3-factor model A	209.46***	74	95.68***	3	2.83	0.08	0.13	0.88
3-factor model B	287.73***	74	173.95***	3	3.89	0.15	0.13	0.82
3-factor model C	243.11***	74	129.33***	3	3.29	0.11	0.14	0.85
3-factor model D	337.14***	74	223.36***	3	4.56	0.18	0.18	0.77
3-factor model E	295.51***	74	181.73***	3	3.99	0.13	0.16	0.77
3-factor model F	133.69***	74	19.91***	3	1.81	0.18	0.08	0.95
2-factor model A	474.53***	76	360.75***	5	6.24	0.18	0.21	0.66
2-factor model B	371.37***	76	257.59***	5	4.89	0.15	0.18	0.75
2-factor model C	298.37***	76	184.59***	5	3.93	0.15	0.16	0.81
1-factor model	475.77***	77	361.99***	6	6.18	0.18	0.21	0.66

Note. N=117. 4-factor model: each variable was treated as a single-factor; 3-factor model A: EI and situational awareness were combined; 3-factor model B: situational awareness and safety compliance were combined; 3-factor model C: situational awareness and safety participation were combined; 3-factor model D: EI and safety compliance were combined; 3-factor model E: EI and safety participation were combined; 3-factor model F: safety compliance and safety participation were combined; 2-factor model A: EI and situational awareness were combined; safety compliance and safety participation were combined; 2-factor model B: EI and safety compliance were combined; situational awareness and safety participation were combined; 2-factor model C: EI and safety participation were combined; situational awareness and safety compliance were combined; 1-factor: all variables were combined.

The means, standard deviations, and correlations for the variables are presented in Table 4.2. As shown in this table, all the variables were positively and significantly correlated with one another.

Table 4.2

Means, Standard Deviations, and Correlations

Variables	Mean	SD	1	2	3	4	5	6
1. Gender	0.96	0.20						
2. Age	1.15	0.40	-.24**					
3. Education	2.72	0.81	-.23**	.24*				
4. Emotional Intelligence	3.97	0.49	.28**	-0.11	0.10			
5. Situational Awareness	3.84	0.54	.12	0.15	0.03	0.60**		
6. Safety Compliance	4.50	0.75	.13	-0.03	0.15	0.27**	0.45**	
7. Safety Participation	4.33	0.76	.17	-0.08	0.13	0.42**	0.51**	0.83**

Note. N = 117.

*p < .05, **p < .01.

The Main and Mediation Effects

The results of the regression analyses are presented in Table 4.3. Age, gender, and education were controlled in all the analyses. EI was determined to be positively and significantly related to situational awareness (Model 2: $\beta = 0.58$, $p < .001$), thus supporting Hypothesis 2 which proposed that EI is positively related to situational awareness.

As safety compliance and safety participation are two distinctive aspects of safety performance, we ran the regression analysis separately for them. In Model 4, the positive regression coefficient of EI on safety compliance was significant ($\beta = 0.26$, $p < .001$), supporting Hypothesis 1a. In Model 5, when situational awareness was added into the regression, the coefficient for the effect of situational awareness on safety compliance was positive and significant ($\beta = 0.43$, $p < .001$); thus, Hypothesis 3a was supported. Hypothesis 4a predicted that situational awareness would mediate the relationship between EI and safety compliance. We used Hayes' (2013)PROCESS macro with 5000 bootstrap samples to test this hypothesis. The results showed a significant indirect effect ($B = 0.38$, boot $SE = 0.12$, 95% CI = [0.20, 0.70]), which indicated that situational awareness mediated the relationship between EI and safety compliance. Therefore, Hypothesis 4a was supported.

In the same manner, we tested safety participation as the dependent variable (see Table 4.3). In Model 8, the regression coefficient for the effect of EI on safety participation was positive and significant ($\beta = 0.41$, $p < .001$), supporting Hypothesis 1b. In Model 9, the regression coefficient for the effect of situational awareness on safety participation was significant ($\beta = 0.38$, $p < .001$) when situational awareness was entered into the regression equation. Thus, Hypothesis 3b was supported. Hypothesis 4b predicted the mediation role of situational awareness in the relationship between EI and safety participation. The analysis demonstrated a significant mediation effect ($B = 0.34$, boot $SE = 0.11$, 95% CI = [0.17, 0.63]), which supported Hypothesis 4b.

Table 4.3

Results of Regression Analyses.

	Situational awareness		Safety compliance				Safety participation			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Gender	0.11	-0.04	0.16	0.10	0.11	0.08	0.19*	0.09	0.10	0.06
Age	-0.14	-0.12	-0.03	-0.02	0.03	0.04	-0.07	-0.06	-0.01	0.00
Education	0.09	0.10	0.20*	0.21*	0.16	0.12	0.19*	0.20*	0.06	0.11
EI		0.58***		0.26***	0.01	0.03		0.41***	0.19	0.22*
Situational awareness					0.43***	0.45***			0.38***	0.41***
Safety compliance										
Safety participation										
EI × Situational awareness						-0.22**				-0.28***
R^2	0.04	0.35***	0.05	0.11**	0.23***	0.28***	0.06	0.22***	0.31***	0.38***
ΔR^2		0.31*** [a]		0.06** [b]	0.18*** [b]	0.05** [c]		0.15*** [d]	0.25*** [d]	0.07*** [e]

Note. N = 117. Standardised estimates are reported. The moderation model for safety compliance was tested in Models 3, 5, and 6, which represented Steps 1, 2, and 3, respectively. The moderation model for safety participation was tested in Models 7, 9, and 10, which represented Steps 1, 2, and 3, respectively.

[a] relative to Model 1.

[b] relative to Model 3.

[c] relative to Model 5.

[d] relative to Model 7.

[e] relative to Model 9.

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Test of Moderation Effects

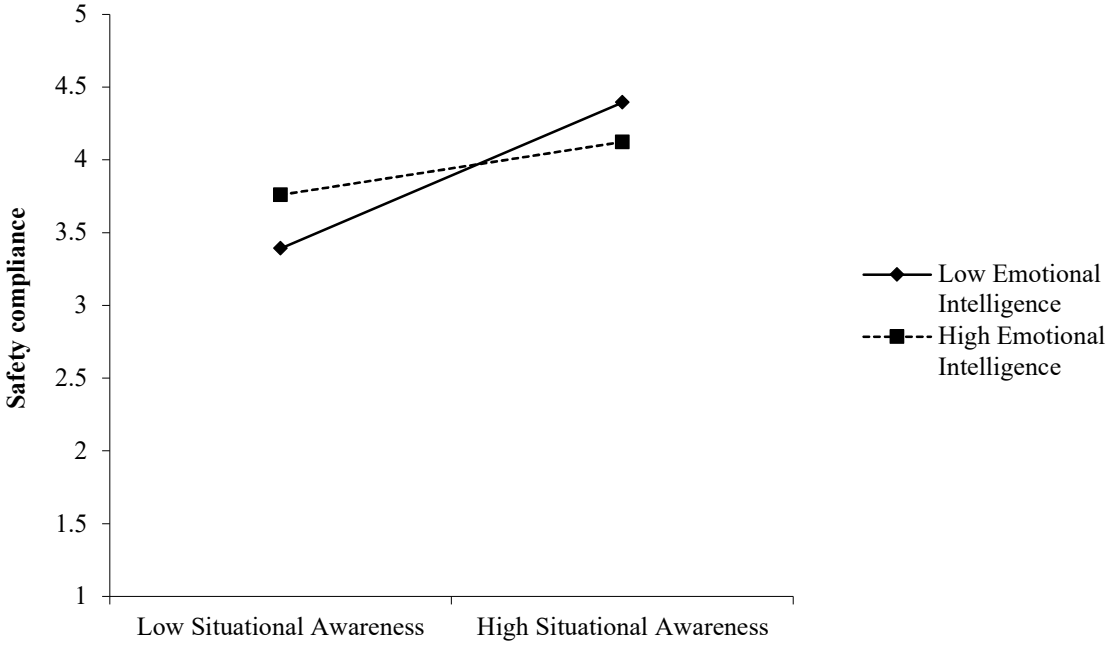
Hypotheses 5a and 5b predicted that EI would be a moderator in the relationship between situational awareness and two safety performance dimensions (safety compliance and safety participation). A three-step hierarchical regression analysis was employed to test these potential moderating effects because this approach is the most well-established approach for testing moderation (Hayes et al., 2017; Jiang, 2016). First, we examined Hypothesis 5a, which predicted the moderating effect of EI on the relationship between situational awareness and safety compliance. As presented in Table 4.2, control variables (gender, age, and education) were entered in Step 1 (Model 3). EI and safety compliance were entered in Step 2 (Model 5). The interaction term of EI and situational awareness was entered in Step 3 (Model 6). EI and situational awareness were mean-centred before entry into the regression equation to reduce multicollinearity. The interaction (EI × situational awareness) was significant ($\beta = -0.22$, $p < .001$) in predicting safety compliance, supporting the existence of a moderating effect of EI in the relationship between situational awareness and safety performance. The simple slopes for the interaction/moderating effects are displayed in Figure 4.2. The relationship between situational awareness and safety compliance was stronger when EI was low (slope = 0.93, $t = 4.93$, $p < .001$) rather than high (slope = 0.34, $t = 1.97$, $p < .05$). These results support Hypothesis 5a.

Then we tested Hypothesis 5b, which predicted the moderating effect of EI on the relationship between situational awareness and safety participation. As presented in Table 4.2, control variables were entered in Step 1 (Model 7). EI and situational awareness were entered in Step 2 (Model 9). The interaction term of mean-centred EI and mean-centred situational awareness was entered in Step 3 (Model 10). The interaction term was significant ($\beta = -0.28$, $p < .001$), initially supporting the moderating role of EI. The simple slopes for the moderating effect are shown in Figure 4.3. The relationship between situational awareness

and safety participation was stronger when EI was low (slope = 0.96, $t = 5.48$, $p < .001$) rather than high (slope = 0.20, $t = 1.26$, $p > .05$). Thus, Hypothesis 5b is also supported.

Figure 4.2

The moderating effect of EI on the relationship between situational awareness and safety compliance.



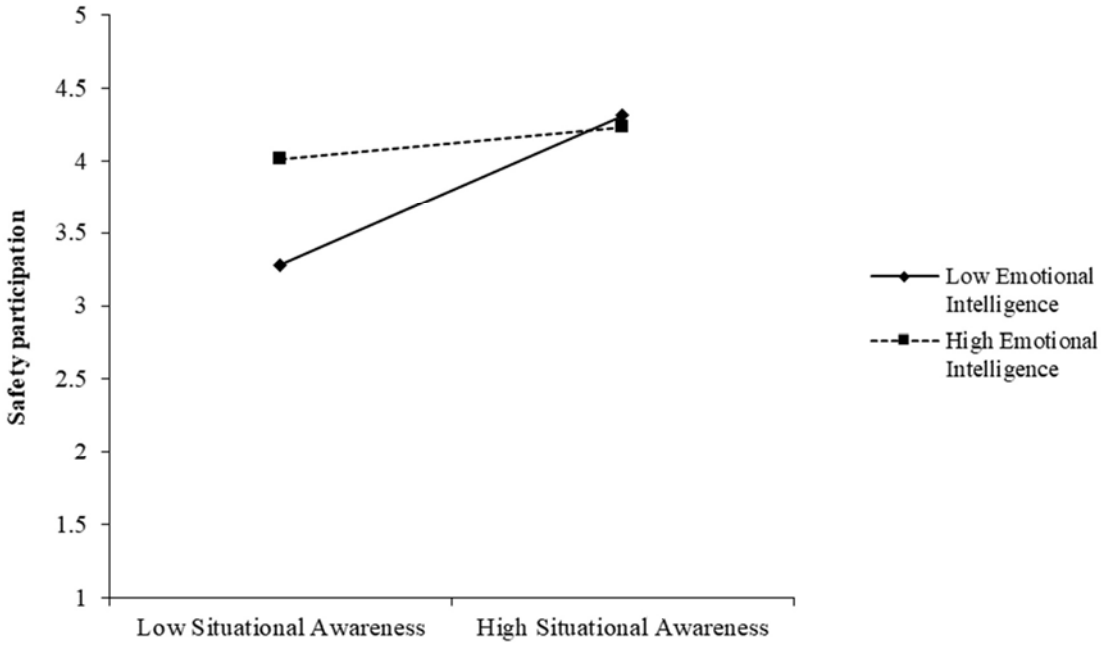
Test of Moderated Mediation Effects

Hypotheses 6a and 6b predicted that the mediating effect of situational awareness on the relationship between EI and safety performance (safety compliance and safety participation) would be stronger for individuals with low rather than high EI. These two moderated mediation hypotheses were tested separately with Hayes' (2013) PROCESS macro for Model 74 based on 5000 bootstrap samples. For Hypothesis 6a, the index of moderated mediation (index = -0.39, boot *SE* = 0.16, 95%CI = [-0.77, -0.13]) suggested a significant difference in the indirect effect of EI on safety compliance via situational awareness (Hayes, 2015). This indirect effect was stronger when EI was low (indirect effect = 0.59, boot *SE* = 0.16, 95%CI = [0.34, 1.00]) rather than high (indirect effect = 0.22, boot *SE* = 0.12, 95%CI =

[-0.004, 0.48]). For Hypothesis 6b, the results indicated that the indirect effect of EI on safety participation via situational awareness was stronger (index = -0.49, boot SE = 0.16, 95%CI = [-0.86, -0.23]) for those with lower (indirect effect = 0.61, boot *SE* = 0.15, 95%CI = [0.38, 0.98]) rather than higher (indirect effect = 0.13, boot *SE* = 0.10, 95%CI = [-0.05, 0.37]) proactivity. These results support Hypotheses 6a and 6b.

Figure 4. 3

The moderating effect of EI on the relationship between situational awareness and safety participation



Discussion

Theoretical Implications

This study used a sample of Chinese pilot trainees to explore the relationships among EI, situational awareness, and safety performance (safety compliance and safety participation). Consistent with the proposed moderated mediation model, the results verify that the positive relationship between EI and safety performance is mediated by situational awareness. Furthermore, we found that EI moderates the positive relationship between

situational awareness and safety performance and that this relationship weakens as individuals' EI increases. This research contributes to the literature in several ways.

First, the present study empirically confirms the role of EI in enhancing safety performance. While prior research suggests that EI can help individuals improve work performance (Bozionelos & Singh, 2017), more specific types of performance that may inherently integrate emotions (e.g., safety behaviours) are underexplored. Our findings extend the implications of the existing EI–performance research by highlighting that emotional competencies that enable individuals to deal with critical tasks (Khalili, 2012), particularly the compliance with and the promotion of safety rules and procedures. Our findings further indicate that EI assists individuals to become situationally aware (e.g., attentive/sensitive to and mindful of their work environments) and consequently makes them more effective in performing safety tasks. This situational awareness-based mediation mechanism explains why and how the effect of EI can be transmitted to affect safety performance. These results support the viewpoint that emotion can facilitate the processing of information (Endsley, 1995c) and the management of contextual `stressors (Endsley, 1995c; Nikolaou & Tsaousis, 2002) to gain higher situational awareness, which in turn bolsters individuals' abilities to conduct safety-related duties.

In addition, this study has verified that EI can be a boundary condition affecting the strength of the relationship between situational awareness and safety performance. Specifically, situational awareness shows the differential influence on safety performance in high- versus low-EI individuals (Hypotheses 6a and 6b). According to our findings, the ability of situational awareness in promoting safety performance is moderated by EI. One explanation for this finding is that high-EI individuals, because of their enhanced emotion management capabilities and information-processing skills in social contexts, may be adept at recognizing and response to environmental cues and, therefore, naturally acquire knowledge

or information regarding the work context (Elfenbein & Eisenkraft, 2010). Therefore, they may not rely heavily on situational awareness because their EI already provides a strong foundation for safety-related behaviours. In contrast, low-EI individuals, who may lack the capabilities to deal with social and contextual information (Mayer et al., 2016), particularly those that causing emotional fluctuation, and are less capable of managing workplace stressors (Jordan et al., 2002), may depend more on situational awareness to improve safety-related behaviours. This suggests that for lower EI individuals, situational awareness is a critical cognitive resource for enhancing safety-related behaviours. The moderating role of EI appears to be robust, for it applies to the influence of situational awareness on both types of safety performance (i.e., safety compliance and safety participation). However, it's important to consider that while EI moderates this relationship, the overall positive correlation between EI, situational awareness, and safety performance supports the conclusion that higher EI enhances an individual's ability to maintain situational awareness and, consequently, their safety performance.

Furthermore, for the first time, we have confirmed that the indirect effect of EI on safety performance (both safety compliance and safety participation), which is mediated by situational awareness, is stronger for individuals who are less emotionally intelligent. Consistent with the moderation of EI in the interaction between situational awareness and safety performance, this moderated mediation process suggests that high-EI individuals are less reliant on situational awareness to excel in safety-related behaviours. Indeed, for individuals with high levels of EI, it seems that situational awareness does not serve as a mediator that transmits the effects of EI on safety performance. Therefore, situational awareness may not be able to explain why EI enhances safety performance for those people with high EI. These findings have integrated the model of EI (Mayer et al., 2011; Wong & Law, 2002), the framework of situational awareness (Endsley, 1988, 2015a), and the theory

of safety performance (Griffin & Neal, 2000) to explain the sophisticated process that shapes safety performance. The moderating role of EI in the situational awareness and safety performance linkage, as well as in the mediation process, provide valuable insights into the interplay of emotional competence, cognitive knowledge or skills, and behavioural commitment to safety.

Limitations and Future Research Directions, and Strengths

This study has several limitations that future researchers should consider. First, the participants in this study were pilot trainees in a flight training school and thus may have lacked sufficient work experience, despite their need to achieve adequate practical experience in their training to become qualified commercial pilots. Also, the majority of the sample were males under 25 years of age (85%). Thus, the phenomena observed in this cohort of participants may not reflect those that may manifest in older, qualified airline pilots. Further research may sample pilots who have already worked in airlines to investigate if our results can be applied to this population.

Second, we only explored situational awareness as a single mediator in the link between EI and safety performance. There might be alternative mediators that can explain the mechanisms underlying this linkage. Further research might consider mediation mechanisms such as mindfulness, thriving, safety motivation, and other psychological states or attitudes.

Third, although the data was collected at two separate time points, the measures for situational awareness and safety performance were collected at the same time. This method may have entailed the risk of common method bias. However, the relationship between situational awareness and safety performance is relatively well-established in the literature (S. Jiang et al., 2021; Stanton et al., 2001), so it may not have been a significant issue to gather data for these two variables in the same survey. Also, the test of moderation effects is usually not subject to common method bias (Walsh & Bartikowski, 2013). Nevertheless, future

research may endeavour to separate the predictor, the mediator, and the criterion in time during data collection.

Fourth, some readers might be concerned about the self-reported measure of safety performance, given that researchers have contended that performance measures should ideally be reported by supervisors (Nielsen et al., 2017). Self-reported performance is not inherently incorrect, but it may to a certain degree be distorted by respondents' social desirability. For safety performance specifically, however, self-reported data has been widely used. Even so, we recommend that future research control for social desirability if self-report performance data are to be used. When practical, however, performance rated by others such as peers and leaders would be a better choice for future research.

Despite the limitations, this research has some important strengths. First, this study is among the first attempts to empirically link EI to two specific safety behaviours (safety compliance and safety participation). By identifying situational awareness as a mediator for these linkages, the findings confirm a new psychological process connecting EI to work performance. Second, this study employs an innovative approach to examine EI, as both a predictor and a moderator, in the mediation process it undertakes to influence safety performance. This approach offers a more nuanced understanding of the role of EI in shaping individuals' safety compliance and participation. Together, these explorations enrich previous research on the association between EI and work performance and can enlighten further developments of safety performance frameworks and theories.

Practical Implications

The current study has important practical implications for an organisation's safety management. First, in line with prior research (Joseph, Jin, Newman, & O'Boyle, 2015), our study suggests that it is critical to consider EI and situational awareness as factors that can direct employees to improve performance. Our findings provide managers with the

knowledge of what factors they can potentially consider when attempting to ensure that employees comply with and actively promote safety procedures, policies, and rules. For instance, organisations may introduce customised training and development programs aimed at enhancing employees' EI by providing workshops on emotional intelligence skills, such as recognising and managing emotions. Additionally, they could offer situational awareness training that teaches employees how to effectively perceive and respond to dynamic work environments. In implementing these initiatives, managers may evaluate EI and situational awareness as accurately as possible to determine the level of resources that are worth investing. In addition, according to our findings, managers also need to consider that individuals with different levels of EI may rely on situational awareness to different degrees when engaging in safety-related behaviours. For example, managers should be aware that customised strategies for increasing situational awareness may work better for less emotionally intelligent employees when the organisation seeks strategies to foster safety performance. For example, organisations can design training programs that cater to varying EI levels among employees. For individuals with lower EI, the focus may be on specific techniques to improve their situational awareness. In aviation, pilot training programs may incorporate modules that improve situational awareness for safety. For pilots with lower EI, specialised training sessions could be offered to enhance their ability to detect and respond to critical situational cues, such as changes in weather conditions or the status of aircraft. In a manufacturing setting, less emotionally intelligent employees may benefit from working closely with experienced colleagues who can demonstrate how to stay attuned to equipment conditions and potential safety hazards. Mentors can share their own experiences and provide feedback to help mentees improve their situational awareness.

Conclusion

This research makes important contributions. First, the research extends the antecedents of safety performance to EI. This extension adds to prior research on the EI–overall work performance relationship (Cote & Miners, 2006; Joseph, Jin, Newman, & O'Boyle, 2015) by focusing on specific types of safety performance. One of the primary contributions of this study is the extension of the antecedents of safety performance to include EI. Recognising the role of EI in safety performance allows organisations to design targeted interventions and training programs. This, in turn, can lead to more effective safety measures and ultimately contribute to accident prevention and employee well-being. Second, through examining the mediation effect of situational awareness, this research reveals a new mechanism that explains how or why EI can contribute to one's safety performance. Third, by investigating the moderating role of EI, this research has identified a new boundary condition underlying the link between situational awareness and safety performance. This effort contributes to a complex view of for whom, or when, the role of situational awareness becomes more salient.

Using a sample of pilot trainees, this study has investigated the influence of EI on individuals' safety performance, with a focus on the mediating effect of situational awareness. We found that EI was positively related to situational awareness, which was subsequently related to individuals' safety performance in terms of safety compliance and safety participation. We have also verified that EI is a boundary condition that influences the strength of the relationship between situational awareness and safety performance. The results suggest that individuals with high EI tend to be less rely on the situational knowledge of the workplace when performing safety-driven tasks. However, individuals with lower levels of EI appear to rely more on situational awareness. These findings advance research on EI, situational awareness, and safety performance, both theoretically and empirically. From a

practitioner's perspective, these findings may facilitate organisations in developing and implementing effective strategies to improve safety performance among staff.

Chapter 5

Linking Emotional Intelligence to Safety Performance: The Roles of Situational Awareness and Safety Training

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This chapter presents the second study conducted on the conditions under which Emotional Intelligence (EI) benefits employees' safety performance in the workplace. The focus of this study is to explore the role of safety training adequacy as a situational cue in activating individuals' EI and driving their safety-related cognitions and behaviours. Drawing upon trait-activation theory (TAT), this chapter presents the theoretical framework and research proposition that underpins the study.

The proposition posits that when employees receive inadequate safety training, their EI is more likely to contribute to the development of situational awareness, which, in turn, positively influences their safety performance. The argument is based on the premise that safety training adequacy serves as a contextual factor that activates the potential benefits of EI in the safety domain.

To empirically test this proposition, the study collected data from 133 airplane pilots working in the commercial aviation sector. The research design aimed to capture the relationships between EI, situational awareness, safety performance, and the moderating effect of training adequacy on the EI-situational awareness relationship.

The findings of the study revealed that training inadequacy negatively moderates the relationship between EI and situational awareness. Specifically, EI is significantly related to situational awareness only when the salience of safety training inadequacy is higher. This suggests that inadequate safety training acts as a catalyst in activating the relationship between EI and situational awareness.

EI has attracted substantial attention in the fields of human resource management due to its significant implications on workplace outcomes. A large number of empirical studies have demonstrated that EI has a positive impact on individuals' work performance. For example, some researchers found that EI-specific attributes, including one's understanding of his/her own and others' emotions, and regulation and utilisation of emotions, collectively enhance task and contextual performance (Bozionelos & Singh, 2017; Ernest H O'Boyle et al., 2011). However, other studies have found that EI has only a marginal or non-significant effect on employee performance (Tu et al., 2018). The inconsistent results suggest that the relationship between EI and work-related performance might be subject to certain conditions. For example, while the effect of EI on important work outcomes such as performance has been emphasised, both theoretically and empirically, some EI researchers argue that the study of EI is better situated in a specific context, particularly where emotions are likely to cause undesirable feelings or psychological states (Miao et al., 2017).

In line with this contention, scholars (e.g., Sunindijo & Zou, 2013) have attempted to investigate the influence of EI in typical safety-critical work contexts (e.g., the construction setting), showing that EI facilitates workers in implementing safety management tasks. Safety-critical situations are prone to raising emotional reactions (Leung et al., 2010); thus, the traits or abilities that enable better control over and regulation of undesirable emotional experiences should help individuals keep safe (Wang et al., 2016). Despite being theoretically meaningful, as we will discuss shortly, empirical research regarding the relationship between EI and safety performance is underdeveloped in multiple ways. To advance our knowledge in this regard, the current paper tests a situation-incurred, conditionally-mediated process underlying the EI–safety performance linkage.

While prior research has assisted with our understanding or forecast of the role of EI in predicting various types of work performance (e.g., safety performance), some areas warrant further investigation. For example, increasing numbers of voices in the literature argue that the influence of EI on performance is more indirect than direct (Ingram et al., 2019; Rode et al., 2007). Within these voices, researchers have argued for the potentiality that the insignificant EI–performance relationship observed in past research (e.g., Tu et al., 2018) could have been due to the ambiguity of EI's ability in explaining more proximate enablers of work performance. This indicates the need to place a focus on the core, proximate indicators of individual performance to explore their variations that are attributed to EI or similar emotional traits or abilities. In the safety-related domain, Endsley (2018)claims that situational awareness is the most important and proximal indicator of individuals' safety performance, especially in industries such as aviation, gas and mining, and construction. This claim is supported by the perspective that situational awareness denotes safety-oriented cognitions or abilities (Endsley, 2000). Based on Endsley, situational awareness is characterised by being aware of what is happening around the workplace, and this involves the capability of appraising critical environmental cues, processing vital safety information, forecasting near-future occurrences, and finding solutions to manage emerging risks. That is, safety performance is largely embedded in individuals' situational awareness (Caponecchia et al., 2018; Endsley & Robertson, 2000). As such, we first focus on situational awareness, which is argued to be a direct manifestation of safety performance, and its relationship with EI.

As stated above, prior research suggests inconsistent findings regarding the EI–performance relationship, indicating the roles of boundary conditions. While situational awareness is not a type of performance itself, it denotes a critical, immediate indicator of safety

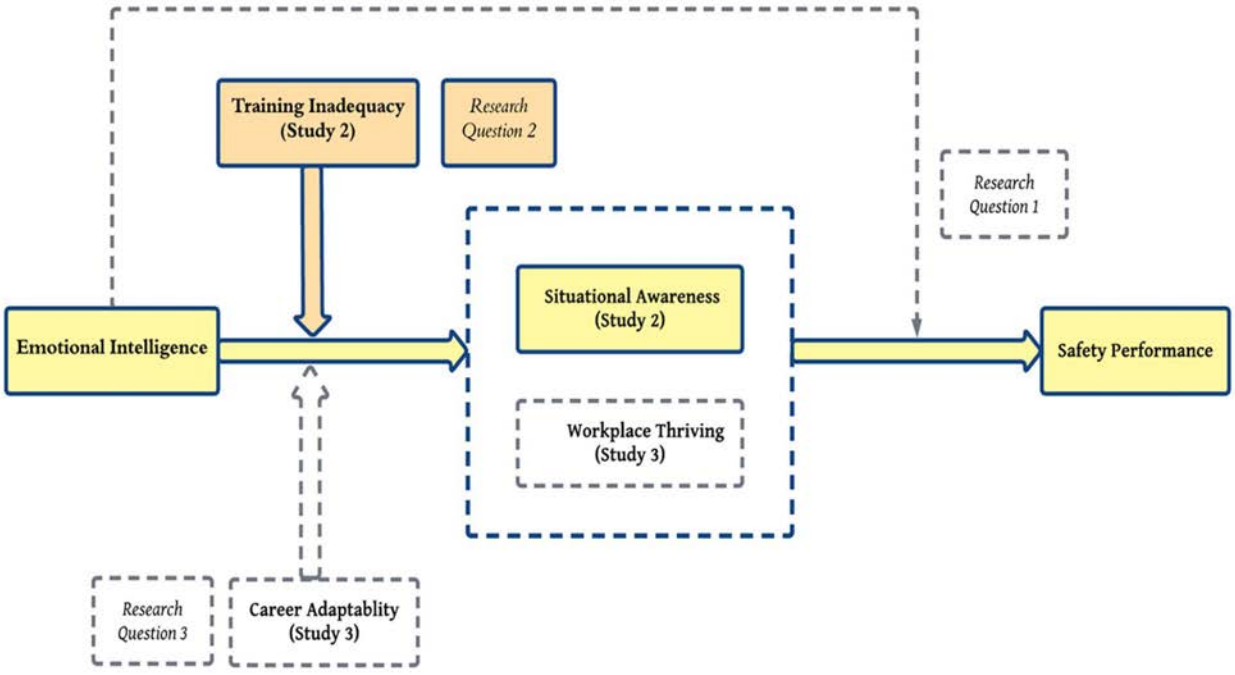
performance (Sneddon et al., 2013); thus, we expect that the relationship between EI and situational awareness may also be subject to certain boundary conditions. In this paper, we consider training-related conditions that may intervene with EI to affect employees' psychological and behavioural reactions. This consideration is based on the view that external cues are important to drive how people use personal resources to guide their understanding of relevant contexts (Tett & Burnett, 2003), and that this importance becomes more salient when external situations become more challenging (Farh et al., 2012). Specifically, for this study, EI is a personal resource which people might rely more on under more challenging circumstances to shape their understanding of the associated environment (e.g., situational awareness) and thus to direct subsequent behaviours (e.g., safety behaviours). The literature has highlighted safety training inadequacy as a significant concern in safety-critical industries and organisations, as evidenced in research suggesting that ineffective or insufficient safety training represents significant challenges that produce heightened anxiety and stress. Therefore, we examine safety training inadequacy as a moderator (i.e., boundary condition) for the effect of EI.

Integrating these ideas, this paper develops and tests a model (Figure 5.1), which proposes that safety training inadequacy will interact with EI to influence situational awareness, which in turn influences safety performance. We draw on trait activation theory (TAT) (Tett & Burnett, 2003) to conceptualise the moderating effect of training inadequacy on the EI-situational awareness relationship. According to TAT, trait-relevant external cues (e.g., task, social, and organisational demands or stressors) are likely to strengthen or weaken the relationship between traits and individuals' cognitive and behavioural outcomes, for traits can be activated by these cues to guide individuals' thoughts and actions. TAT and related research highlights that these traits are broadly defined as personal attributes that may not change rapidly

in time (Farh et al., 2012). In the present study, EI is such an attribute; it denotes an individual's "emotions-related behavioural dispositions and self-perceived abilities" (Sanchez-Ruiz et al., 2013, p. 658). Following Farh et al.'s (2012) application of TAT in EI research, as we will theorise later, this paper argues that EI will be activated by challenging external cues (e.g., safety training inadequacy) to affect situational awareness. Since situational awareness is an immediate enabler of safety performance (Endsley, 2000), we also expect that when activated by training inadequacy, the role of EI will extend to impact safety performance through situational awareness.

Figure 5.1

Research Model-Study2



This paper contributes to the literature in different ways. First, it sheds light on an indirect approach to exploring the EI–performance link, for which prior research has generated

inconclusive results. Specifically, by extending this link to the safety context, we emphasise the importance of focusing on a core, proximal indicator of safety performance (i.e., situational awareness) to appreciate the role played by EI. Second and relatedly, our research advances the EI–performance literature by identifying safety training inadequacy as a boundary condition that triggers emotional competence to function in building employees' situational awareness. Extending TAT (Tett & Burnett, 2003) into the safety performance setting to explain the effect of EI, we verify that EI, a self-perceived ability operationalised through a trait approach (i.e., self-rated EI) , when activated by the inadequacy of training (an opposing work demand), contributes to shaping situational awareness. Third, it enriches the EI and work performance theories by verifying the moderating mediation model of EI–safety performance involving situational awareness as a mediator and safety training inadequacy as a boundary condition, thereby providing a new explanation of when and how EI might matter in employee performance.

Theory and Hypotheses

According to Mayer and Geher (1996), EI refers to individuals' ability to regulate and use emotional competence to guide thinking and improve performance. In the daily workplace, which Khalili (2012) calls an emotion-eliciting environment, there would be a variety of emotional distractions from intrapersonal factors (e.g., personal health and family issues), interpersonal factors (e.g., the relationship with colleagues and supervisors), and other factors (e.g., stressful company or environment). These distractions can perturb people's moods and cause unpleasant feelings, and the planned work scheme may thus be interrupted when individuals are less able to control these emotional experiences (Cardenas et al., 2004). It is

important to cast aside the distractions and focus on the most urgent/important tasks to avoid unnecessary consumption of mental energy if one is to be effective at work.

The literature suggests the relevance of EI-related attributes in one's awareness of or attention to one's affiliated situation. For example, have summarised that employees with high emotional regulation skills tend to be more vigilant to emerging information from colleagues and the work environment, be more proficient in distinguishing various types of information, and shift attention from less significant tasks to focus on the more critical. In the course of performing work, situational awareness plays a crucial role during the decision-making process (Endsley & Robertson, 2000). According to Endsley (1988, p. 97), situational awareness refers to "the perception of elements of the environment, the comprehension of their meaning, and the projection of their future status". The process of accomplishing a specific task involves effective information analysis, planning, decision-making and action. As Durso et al. (1999) emphasised, situational awareness establishes the foundation of decision-making that requires significant attention to contextual cues.

Research indicates that it is important to maintain a comfortable stable mood in the workplace without the interference of negative emotions (Muchinsky, 2000). This requires a person to possess effective emotional management abilities or traits (e.g., EI). Emotions bias people's thinking and behaviour (Miner & Glomb, 2010). For instance, individuals are likely to overestimate their capabilities and neglect the distal details when in a good mood. In contrast, people tend to underestimate their abilities and lack confidence when in a bad mood. Either way, intense emotions could alter people's way of thinking, interfere with their attention, and lead them to make decisions that violate their original purpose (Beal et al., 2005). These arguments assert that EI may be positively related to situational awareness because EI involves one using

emotions to reason about situational information and to help undertake rational behaviours. However, as discussed earlier, in safety contexts, this potential relationship between EI and situational awareness might be subject to the level of safety training inadequacy. Below, we theorise how safety training inadequacy might alter the strength of this relationship.

The Moderating Role of Safety Training Inadequacy

This paper draws upon the trait-activation perspective to discuss the role of training inadequacy. Previous research has proved that many personal traits are stable dispositions that can predict work performance (Barrick et al., 2001; Mount et al., 1998) and verified that whether and to what extent they can influence one's behaviour and performance is subject to situational cues (Kell et al., 2010). Based on a personality–job fit perspective combined with a trait–situation interaction perspective, Tett and Burnett (2003) introduced TAT to explain how traits or stable individual attributes can drive one's psychological and behavioural reactions by considering contextual interferences.

TAT presents a person–situation interactionist perspective suggesting that trait-relevant situations (or situational cues) can activate an individual's way of expressing their traits, therefore influencing work performance (Tett & Burnett, 2003). In the workplace, employees prefer to seek jobs that can easily express their instinctive traits or use their attributes to pursue satisfaction and achieve success (Farh et al., 2012).For example, an introverted person will not look for a sales or customer service job because he/she knows the challenges will put him/her in an unfavourable situation. In contrast, an extraverted person may easily use their strengths to gain satisfaction in the above jobs. This is consistent with Johns'(2006) perspective that work contexts can be situational opportunities or constraints to enlarge or suppress the influence of

traits on work performance, depending on whether the situation or associated cues are relevant/important to the traits.

In the present study, EI is a trait-like attribute that reflects one's self-perceived capability (Wong & Law, 2002). Applying TAT to this case, certain situational or context cues might activate EI to manifest its function on employee outcomes. TAT states that traits are activated by task, social, or organisational cues to affect performance (Tett & Burnett, 2003), partly because activated traits or relatively stable attributes (e.g., trait-like abilities) elicit cognitions or psychological states before changing behaviours or performance (Blickle et al., 2018). Situational awareness, as noted earlier, reflects such psychological cognitions relevant to one's environment, and it is a precursor of work performance (e.g., safety performance) (Irwin et al., 2019). In line with TAT, we propose that the EI and situational awareness relationship will be stronger when safety training inadequacy becomes more salient.

Training equips individuals with essential skills and relevant capabilities to perform their tasks and duties in an effective manner (Bartel, 1995). In a safety-critical work context, inadequate safety training may result in consequences harmful to the individual (e.g., stress, errors, and mistakes) and the organisation (e.g., turnover, low productivity, and jeopardised safety patterns) (Dysvik & Kuvaas, 2008; Elnaga & Imran, 2013). Importantly, when employees are aware that the company offers insufficient training, which hinders them from gaining relevant resources that are needed to navigate or explore the safety-critical environment, they tend to seek from inside (i.e., within the individual) and use related personal abilities/resources to deal with the situation.

A lack of safety training may represent situational constraints, which to some extent signal the cue that employees may not immediately gain resources from the organisation before

the situation is improved. Research indicates that inadequate training impairs employees' confidence, raises concerns, and incurs negative emotions (e.g., fear, depression, and anxiety) (Huber et al., 2015). These negative psychological and emotional experiences would need individuals to access and utilise effective emotional management abilities or attributes to maintain their cognitive, attitudinal, or behavioural engagement at work (Rothbard & Wilk, 2011).

This line of reasoning suggests that when safety training is not adequate, it sends out the contextual cue that the lack of knowledge/information to evaluate or forecast the safety-critical situation will lead to emotionally challenging circumstances. In this case, EI, which can assist to manage these challenging circumstances, is likely to be activated to help deal with associated unpleasant emotions (e.g., frustration, fear, confusion, or anxiety) so as to maintain situational awareness, which is a key to ensuring safety (Endsley, 2000). Therefore, when there is a lack of training, EI will play a stronger role in promoting and maintaining situational awareness. Conversely, when training is abundant, the role of EI might be less prominent. Thus, we propose:

Hypothesis 1: Safety training inadequacy will strengthen the relationship between EI and situational awareness.

The Moderated Mediation Effect on Safety Performance

In addition to the above direct implications for situational awareness, we also propose that EI and safety training adequacy have downstream implications for safety performance. In fact, as mentioned earlier, past research has verified that situational awareness is an important antecedent of safety performance (Endsley, 1999b; Fernandes & Braarud, 2015). In the case of the complex work environment, a lack of situational awareness can cause severe consequences that incur risks and unsafe behaviours (Nazir et al., 2012). Some researchers hold that situational

awareness reflects cognitive motivations for information processing (Van Winsen et al., 2015), which is needed to direct safety actions. Based on the workplace safety research literature, these motivational characteristics associated with situational awareness can directly enable employees to perform tasks safely (Christian et al., 2009). Integrating these arguments with the aforementioned discussions of the interactive effect of EI and safety training inadequacy on situational awareness, we propose that safety training adequacy will moderate the mediated effect of situational awareness on the relationship between EI and safety performance. Specifically, under high levels of safety training inadequacy, individuals will rely more on EI to maintain situational awareness, and in turn achieve better safety performance. In contrast, when safety training is abundant (i.e., low levels of training inadequacy), individuals become more confident in using gained safety-related knowledge and skills through training to conduct their tasks; thus, their EI tends to have less of an impact on situational awareness and in turn on safety performance. Therefore, we posit the following moderated mediation effects:

Hypothesis 2: Safety training inadequacy moderates the mediated relationship between EI and safety performance through situational awareness, such that the mediated relationship will be stronger when safety training is more inadequate.

Methods

Sample and Procedure

Participants of this research were full-time pilots working in the commercial aviation industry in China. With the assistance of the pilot manager in a Chinese airline, paper and online questionnaires were administered among frontline pilots. Participants were asked to complete a two-wave survey at two separate time points. In the first questionnaire, pilots provided demographic information and answered questions regarding EI and safety training inadequacy.

Approximately one month later, they were asked to respond to the second questionnaire, which included questions regarding situational awareness and safety performance.

In Time 1, a total of 211 (response rate = 79.32%) returned usable responses. In Time 2, 161 (response rate = 76.30%) returned valid questionnaires. For each individual, his or her two questionnaires were matched using a self-created, unique code that mixed numbers and letters. Finally, questionnaires were successfully matched for 133 pilots. In this sample, 97.7% of the respondents were male. The average age was 28.66 years (SD = 4.11), and all of them had completed tertiary education. The average job tenure was 38.86 months (SD = 41.27).

Measures

Measurement items were originally written in English and then translated into Chinese following a back-translation procedure (Brislin, 1980). Participants rated all these items using a Likert-type scale (1 = strongly disagree; 5 = strongly agree).

EI. The sixteen-item scale developed by measured emotional intelligence. These items collectively capture individuals' abilities in understanding their own and others' feelings, regulating emotions, and using emotions for motivation purposes. Example items are "I am sensitive to the feelings and emotions of others" and "I am able to control my temper and handle difficulties rationally". The Cronbach's α for emotional intelligence was .89.

Safety training inadequacy. Four items developed by Evans et al. (2007) were employed to measure the inadequacy of safety training in the organisation. An example item is "Company training provided adequate skills and experience to carry out normal operations safely" (reverse coded). The Cronbach's α for safety training inadequacy was .85.

Situational awareness. The thirteen-item scale created by Sætrevik (2013) was adopted to measure pilots' situational awareness. Example items are "I plan ahead in order to handle

various and adverse incident that may arise" and "I usually know what's going to happen next with regard to safety". The Cronbach's α for situational awareness was .62.

Safety performance. The seven-item instrument developed by Griffin and Neal (2000)was employed to measure pilots' safety performance. This instrument captures individuals' compliance and participation in safety procedures and behaviours in the workplace setting. Example items are "I carry out work in a safe manner" and "I help my co-workers when they are working under risky or hazardous conditions". The Cronbach's α for safety performance was .93.

Control variables. As prior research indicated that age, gender, and job tenure could potentially impact employees' safety performance, as in other studies (e.g., Griffin & Hu, 2013), these variables were controlled in the data analyses. Because safety performance was self-reported, the supplementary analyses controlled for social desirability, which, as some researchers have argued, could potentially lead participants to offer slightly, if not to a large extent, more favourable performance ratings. If the results remain similar regardless of controlling for social desirability, or the expected relationship becomes more prominent, or the social desirability is not significantly related to performance/behaviour, it is less likely that the results are distorted by self-rated measures of performance or behaviour (e.g., Y.-N. Cheng et al., 2012; Crant, 1995). Social desirability was measured by five items developed. An example item is "I am always courteous even to people who are disagreeable". The Cronbach's α for social desirability was .63.

Data Analysis

Missing values were dealt with by multiple imputation (Bernaards & Sijtsma, 2000). Specifically, if a participant had missing data on several but not all items on the scale for a

variable, we followed in applying the full information maximum likelihood (FIML) to replace these missing values. Those participants that had all items missing on a scale were excluded from subsequent analyses, for there was no information/data on this scale that could be used for imputation (Bernaards & Sijtsma, 2000). Three cases had missing values for age and/or job tenure and were excluded from the main analyses. This process resulted in a sample of 130 for confirmatory factor analysis (CFA), and the listwise deletion resulted in a sample of 126 for correlational and regression analyses.

Before the hypotheses were tested, CFA was conducted to examine the discriminant validity of the four focal study variables (i.e., EI, safety training inadequacy, situational awareness, and safety performance) measured by multiple items. Considering the relatively small sample size and the large number of measurement items, we followed the recommendation of Little et al.'s (2002) in creating item parcels to reduce the inflation errors. EI and situational awareness were each represented by four parcels and safety performance by two parcels. The moderation hypothesis (Hypothesis 1) was examined using hierarchical regression analysis. The moderated mediation hypothesis (Hypothesis 2) was tested using the PROCESS code for SPSS (Hayes, 2013).

Results

Confirmatory Factor Analysis (CFA)

To check if the key variables featured in the research model (Figure 5.1) could be distinguished from one another, we conducted CFA to test the measurement model. The hypothesised baseline model was a four-factor model, in which EI, safety training inadequacy, situational awareness, and safety performance were loaded on four separate factors. We compared this model with six three-factor models, three two-factor models, and a one-factor

model. The results of CFA are shown in Table 5.1. The four-factor measurement model achieved a fit better than those of all other alternative models. This result suggested that EI, safety training inadequacy, situational awareness and safety performance were empirically distinct constructs in the current research, sufficiently justifying the treatment of them as separate variables in the following analyses.

Table 5.1

CFA Results

Models	χ^2	*df*	$\Delta\chi^2$	Δdf	χ^2/df	SRMR	RMSEA	CFI
4-factor model	**99.32***	**71**	**---**	**---**	**1.40**	**0.07**	**0.06**	**0.96**
3-factor model A	173.91***	74	74.60***	3	2.35	0.10	0.10	0.84
3-factor model B	169.83***	74	70.51***	3	2.29	0.10	0.10	0.85
3-factor model C	197.74***	74	98.42***	3	2.67	0.11	0.11	0.81
3-factor model D	258.40***	74	159.09***	3	3.49	0.11	0.14	0.71
3-factor model E	243.46***	74	144.14***	3	3.29	0.10	0.13	0.73
3-factor model F	181.26***	74	81.94***	3	2.45	0.11	0.11	0.83
2-factor model A	267.06***	76	167.74***	5	3.51	0.13	0.14	0.70
2-factor model B	329.79***	76	230.47***	5	4.34	0.13	0.16	0.60
2-factor model C	322.66***	76	223.35***	5	4.25	0.13	0.16	0.61
1-factor model	423.29***	77	323.97***	6	5.50	0.16	0.19	0.46

Note. N=130. Three cases were excluded because of missing values. 4-factor model: each variable was treated as a single-factor; 3-factor model A: EI and situational awareness were combined; 3-factor model B: situational awareness and safety performance were combined; 3-factor model C: EI and training inadequacy were combined; 3-factor model D: Training inadequacy and safety performance were combined; 3-factor model E: EI and safety performance were combined; 3-factor model F: training inadequacy and situational awareness were combined; 2-factor model A: EI and training inadequacy were combined; situational awareness and safety

performance were combined; 2-factor model B: EI and situational awareness were combined; training inadequacy and safety performance were combined; 2-factor model C: EI and safety performance were combined; situational awareness and training inadequacy were combined; 1-factor: all variables were combined.

Descriptive Statistics

The means, standard deviations, and correlations of the demographic controls and the four main variables are shown in Table 5.2. EI was significantly related to safety performance but not situational awareness. Consistent with several scholars' (Farh et al., 2012) view that the influence of EI on employee states or outcomes to some extent depends on boundary conditions, this result offered initial insights on the necessity of testing moderators of EI regarding its relationship with situational awareness. Detailed results regarding the moderation follow.

Table 5.2

Means, Standard Deviations, and Correlations

Variables	Mean	SD	1	2	3	4	5	6
1. Gender	0.98	0.15						
2. Age	28.75	4.12	.00					
3. Job tenure (months)	39.31	41.90	.00	.66**				
4. Emotional intelligence	3.89	0.50	-.02	-.17	-.17			
5. Training inadequacy	1.65	0.66	-.04	.17	.12	-.29**		
6. Situational awareness	3.61	0.37	.010	.16	.12	.13	-.09	
7. Safety performance	4.32	0.72	.03	-.06	-.03	.26**	-.26**	.21*

Note. N = 126. Listwise deletion was applied. Gender was dummy coded (male = 1 and female = 0).

*p < .05, **p < .01.

Results of Hypothesis Testing

Hypothesis 1, the moderation hypothesis, predicted that safety training inadequacy would strengthen the relationship between EI and situational awareness. It required a test of the interaction effect of EI and safety training inadequacy on situational awareness. We followed the well-established and most widely used procedure for moderation testing (Hayes, 2017),

hierarchical regression analysis, in examining this hypothesis. The results are reported in Table 5.3.

Table 5.3

Results of Moderated Regression Analyses (Hypothesis 1)

	Situational awareness		
	Step 1	Step 2	Step 3
Gender	0.10	0.09	0.10
Age	0.14	0.17	0.20
Job tenure (months)	0.02	0.04	0.04
Emotional intelligence (EI)		0.14	0.17^{+}
Training inadequacy		-0.08	-0.09
EI × training inadequacy			0.21^{*}
R^2	0.03	0.07	0.11^{*}
ΔR^2		0.03 [a]	0.04^{*} [b]

Note. N = 126. Listwise deletion was applied. Standardised estimates are reported.

$^{+}p < 0.10$, $^{*}p < 0.05$.

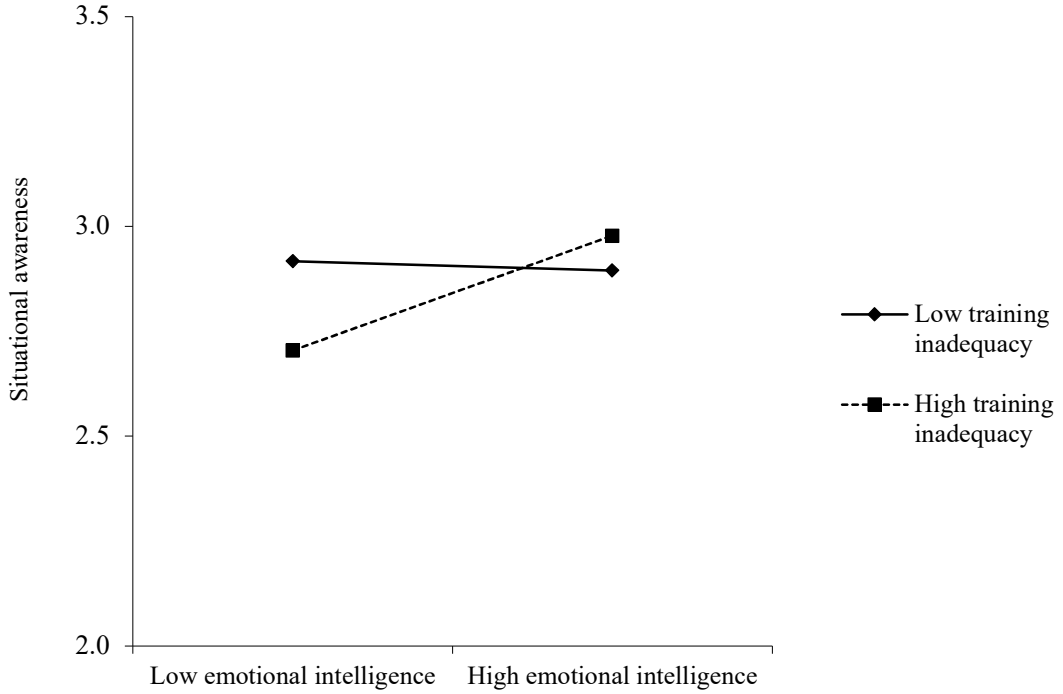
As can be seen from Table 3, we followed our predecessors in performing a three-step hierarchical regression. In Step 1, control variables including gender, age, and job tenure were entered. In Step 2, the main effect step, the independent (i.e., EI) and moderating (i.e., safety training inadequacy) variables were entered. In Step 3 was entered the interaction term, which was equal to the product of IE and safety training inadequacy. In accordance with the advice of Aiken et al. (1991), both EI and safety training inadequacy were mean-centred before the interaction term was calculated to reduce multicollinearity. According to Baron and Kenny (1986), testing a moderating effect does not require the main effects of the independent and moderating variables to be statistically significant. When the interaction term is significant in

predicting the dependent variable (i.e., situational awareness for this particular moderation analysis), it reveals the existence of a moderation.

As Table 5.3 presents, the interaction between EI and safety training inadequacy was significant in predicting situational awareness ($\beta = .21$, $p < .05$), providing initial support for the moderating role of safety training inadequacy. To verify if the moderation was in the expected direction, we followed Dawson (2014) in creating a graphic presentation of the interaction effect. Specifically, we plotted the simple slope of the effect of EI on situational awareness one standard deviation above and below the mean of safety training inadequacy (see Figure 5.2). Results of simple slope analysis showed that EI had a significant, positive effect on situational awareness only when safety training inadequacy was high (simple slope = 0.28, $t = 2.76$, $p < .01$), and there was not a significant effect when safety training inadequacy was low (simple slope = -0.02, $t = -0.255$, $p > .10$). Therefore, the relationship between EI and situational awareness was stronger when there was a higher level of safety training inadequacy, supporting Hypothesis 1.

Figure 5. 2

The moderating effect of Training Inadequacy on the relationship between Emotional Intelligence and Situational Awareness



Hypothesis 2 predicted that training inadequacy would suppress the indirect relationship between EI and safety performance through situational awareness. This hypothesis represented a first-stage moderated mediation. According to Hayes (2013), the test of a first-stage moderated mediation requires (1) testing the moderation of the first stage of the mediation and (2) testing the conditional indirect effects. Specifically, for the current research, Hypothesis 1 has supported that safety training inadequacy moderated the first stage of the mediation (i.e., the link between EI and situational awareness). The conditional indirect effects were examined with Hayes' (2013) PROCESS code for SPSS with 5000 bootstrap samples. Following Belogolovsky et al. (2012), we used a ninety-percent bias-corrected confidence interval to test the significance of conditional indirect effects in our main analyses. A confidence interval not including zero indicates that an indirect effect is statistically significant (Hayes, 2013).

Table 5.4 presents the conditional indirect effects across low and high levels of training inadequacy. Results showed that the conditional indirect effect of EI on safety performance through situational awareness was significant under high-level training inadequacy (B = 0.10, Boot SE = 0.06, 90%CI = [0.02, 0.21]) but nonsignificant under low-level training inadequacy (B = -0.01, Boot SE = 0.04, 90%CI = [-0.09, 0.06]). The index of moderated mediation was significant (index = 0.08, Boot SE = 0.06, 90%CI = [0.01, 0.21]), suggesting that these two conditional indirect effects were significantly different from each other. These results demonstrated that only under high levels of safety training inadequacy could situational awareness mediate the relationship between EI and safety performance. Therefore, the mediated relationship was stronger when safety training inadequacy was high rather than low, and Hypothesis 2 was supported.

Table 5.4

Conditional Indirect Effects of Emotional Intelligence on Safety Performance via Situational Awareness (Hypothesis 2)

	B	Boot SE	Boot LLCI	Boot ULCI
Conditional Indirect Effects				
Low-level training inadequacy	-0.01	0.04	-0.09	0.06
High-level training inadequacy	0.10	0.06	0.02	0.21
Index of Moderated Mediation	0.08	0.06	0.01	0.21

Note: LLCI = lower limit confidence interval (CI). ULCI = upper limit CI. 90%CI based on 5000 bootstrap samples. Low-level and high-level training inadequacy equals one standard deviation below and above the mean of training inadequacy.

Supplementary Analysis

As noted earlier, since some researchers argue that self-rated performance may be inflated by the respondents because of the socially desirable orientation (Schriesheim, 1980), we conducted additional analyses to test the proposed hypotheses by controlling for social desirability. Specifically, in these supplementary analyses, social desirability was added to the group of control variables in the hierarchical regression analysis for the moderation (for Hypothesis 1) and to the group of covariates controlled for both situational awareness and safety performance in the PROCESS analysis (for Hypothesis 2).

Results showed that the hypotheses remained supported. Similar to the main analyses reported above, the interaction term of EI and safety training inadequacy in predicting situational awareness was positive and significant ($\beta = .21$, $p < .05$). PROCESS results, with social desirability controlled for and based on 5000 bootstrap samples, demonstrated that the conditional indirect effect of EI on safety performance through situational awareness was stronger when safety training inadequacy was high (*B* = 0.10, Boot *SE* = 0.06, 95%*CI* = [0.01, 0.27]) rather than low (*B* = -0.02, Boot *SE* = 0.04, 95%*CI* = [-0.12, 0.06]). The index of moderated mediation was significant (Index = 0.09, Boot *SE* = 0.07, 95%*CI* = [0.001, 0.26]). Altogether, these results further consolidated the support of the proposed hypotheses.

Discussion

Researchers have begun investigating the role of EI in safety contexts. However, our knowledge of how and when EI matters in promoting employees' safety performance is still limited. Inconsistent findings in the literature regarding the EI–performance linkage have led researchers to see the value of focusing on the indirect effect of EI on performance and the associated boundary conditions (i.e., moderators) to explore how EI influences performance

(Rode et al., 2007). To this end, we investigated the relationship between EI and safety performance through the mechanism of situational awareness, a proximal enabler of safety performance, and the moderating role of safety training inadequacy, which is an important but underestimated boundary condition in the effects of EI. Our findings suggested that safety training inadequacy strengthened the link between EI and situational awareness, meaning that for those individuals receiving inadequate safety training, EI was more likely to contribute positively to their situational awareness, as compared to those receiving adequate training. In addition, we found that the moderating effect of safety training inadequacy could extend to moderate the indirect effect of EI on safety performance through situational awareness. In the following sections, we discuss the theoretical and practical implications of these findings, as well as the limitations of this study and suggestions for future research.

Theoretical Implications

Drawing on the trait-activation perspective (Tett & Burnett, 2003), we proposed and found that EI would interact with safety training inadequacy to affect situational awareness, and in turn influence safety performance. Our study has important theoretical implications. First, we empirically contribute to the theoretical indication that the EI–performance relationship is more indirect through extending the focus to a proximal antecedent of safety performance (i.e., situational awareness) and probing the boundary condition underlying its relationship with EI. According to our results, the influence of EI on situational awareness is conditional on safety training inadequacy. Specifically, this influence tends to be consolidated when training is more inadequate. Therefore, training inadequacy, as a contextual factor, can trigger the role of EI in promoting situational awareness. This finding is consistent with TAT (Tett & Burnett, 2003), which emphasises that personal attributes of a relatively stable nature can be activated by certain

contexts to exert influences on one's cognitions, psychological states, and behaviours (Farh et al., 2012; Judge & Zapata, 2015). In our case, when safety training is less adequate, EI is activated to play a role. For example, when a company cannot provide sufficient safety training, from which employees may benefit little, if any, to improve their situational awareness at work where safety needs particular attention. In this case, as per our findings, employees with high-level EI may be better able to conquer the challenges associated with lack of training to maintain a certain level of situational awareness needed in safety contexts.

This observation regarding employees whose EI is activated is also in accordance with previous studies that show that, when facing a disadvantaged or challenging situation, individuals with higher levels of EI are more likely to take proactive actions than to be passive. For example, high-EI individuals usually actively seek advice from experienced colleagues or supervisors, or they search for useful material online to increase their safety knowledge and boost safety-related situational awareness. In the workplace, individuals with high levels of EI will be more vigilant, such as becoming more cautious about the emerging information, paying attention to the details, and discreetly forecasting the changes (Brackett et al., 2011). These tendencies characterise one's mindfulness or heedfulness toward his or her associated environments, and thus they are an explicit symbolisation of situational awareness (Brackett et al., 2011). In contrast, instead of being active in looking for solutions to tackle the challenges (e.g., inadequate training), low-level EI employees may respond passively and negatively by complaining, losing confidence, and misinterpreting contextual information, which can lead to or be the embodiments of poor situational awareness (Jordan et al., 2002).

Second, we extended the moderation model to test a moderated mediation that represents a more complex process explaining the EI–safety performance relationship. Specifically, we

have verified the downstream implications of situational awareness, the level of which varies with the interaction of EI and safety training inadequacy, on safety performance. By doing so, we broaden the impact of EI on performance through an expanded application to safety performance at work, an underexplored area in both EI and safety domains, as well as supplement the emerging but limited studies on the EI–safety performance linkage, which have neglected the boundary conditions of how EI matters in boosting safety behaviours. The findings of the present study indicate that only when safety training is inadequate can situational awareness serve as a mediation mechanism to transmit the effect of EI to safety performance. When employees receive adequate training, the mediating effect of situational awareness disappears.

These findings provide evidence for Rode et al.'s (2007) contention that EI's influence on employees' attitudes and behaviours may not be overt or direct and that it depends on work contexts and conditions. In this research, safety training inadequacy, serving as an adverse condition, boosts a greater effect of EI to facilitate the development of situational awareness, which enables superior performance in a safety-critical environment. What is implied is that while negative conditions may strike individuals' mindsets and mental/cognitive models and lead to lower performance, personal attributes like EI are likely to help alleviate this strike and thus maintain the situational awareness-based process underlying the EI–safety performance relationship. This implication accords with the TAT theory, which indicates that organisation-level constraints can activate less-changeable personal traits or abilities to initiate a process that improves performance (Tett & Burnett, 2003). In the present study, we have highlighted that when employees are aware that the company offers insufficient training that is needed for safety effectiveness, they tend to turn to the self and utilise related abilities or traits to guide their cognitions so as to achieve the desired safety performance. From a broader perspective, this is

supportive of the view that the conflict between the demands of performing well and the lack of training make it important for individuals to rely on personal resources (e.g., EI) to master the situation and achieve better performance (Brackett et al., 2006; Rhee et al., 2017).

Practical Implications

Our study has important implications for managerial practice. For example, our findings provide organisations and managers, particularly those in safety-critical industries, with the knowledge that employees' EI does matter in persuading them to comply with safety procedures and participate in building a safe workplace climate. However, to what extent managers can expect to rely on or improve employees' EI to ensure desirable safety performance depends on specific situations, some of which are under the organisations or the manager's control. Our results indicate that whether employees receive enough safety-related training can help guide managers' emphasis on employees' EI.

From the human resource management perspective, it is ideal that organisations can provide comprehensive, quality safety training to employees. However, it is often the case that the organisation lacks resources or has unintentionally neglected certain aspects, damaging the quality of training development or delivery (Analoui, 2000); alternatively, due to individual differences, the content may not be well received and/or digested by trainees even when quality development/delivery is assured from the organisation side (Brown, 2001). Our results suggest that if the organisation does not provide, or employees do not perceive, enough safety training, those with higher levels of EI may be better able to keep on track with safety performance, for their EI is more likely to help them maintain situational awareness, which is key to ensuring safe behaviours. Therefore, when managers are aware of problems with safety training, they might pay more attention to employees who are less emotionally intelligent, especially when these

training problems may not be fixed in a rapid and/or effective manner. In this case, work unit managers may work with human resource managers to consider implementing strategies to improve employees' EI through, for example, coaching, mentoring, and peer support (Mattingly & Kraiger, 2019). It might also be useful if employees' EI is first assessed by professional experts (e.g., researchers and/or management consults) using one or more appropriate methods (e.g., surveys, test banks, and interviews). The information generated from such assessments could help managers make effective decisions regarding who should be prioritised (i.e., those with lower levels of EI) when EI-enhancing strategies are to be implemented.

When training ineffectiveness is an existing shortcoming, our findings also have implications on the recruitment and selection process. As mentioned earlier, we found that inadequate training makes the role of EI more salient in improving situational awareness and thus safety performance. Based on this finding, human resource managers, aware of the organisation's weakness in training, may consider incorporating EI assessments in the recruitment and selection of new staff for safety-critical positions. For example, it could be practical that an appropriate threshold is predetermined for the results of an EI assessment to exclude applicants with low levels of EI.

Limitations and Future Research

This study has a few limitations that future research could address. First, we focused specifically on the training (in)adequacy when exploring the boundary conditions of the effects of EI on situational awareness, and subsequently on safety performance. However, training (in)adequacy may only be considered a subcomponent of training (in)effectiveness, which may also contain elements such as uselessness/usefulness of training. As such, it is uncertain whether the overall quality of safety training could moderate the influence of EI. Future research should

consider the role of overall safety training effectiveness, which can more comprehensively capture the training-related situation, when testing the relationship between EI, situational awareness, and safety performance.

Second, related to the boundary condition, we exclusively concentrated on the interaction effect of the training-related context and EI, having neglected other possible contextual features. Indeed, the literature suggests that contextual variables at the job and organisation levels might also serve as triggers to promote the functions of EI in employee outcomes. For example, a lack of job autonomy may require employees to handle barriers to satisfying important, basic psychological needs (e.g., need for autonomy) and thus may activate their EI to regulate negative feelings caused by relevant barriers (Kim et al., 2009). At the organisation level, the clarity of safety policy may intervene in the effects of EI. When safety policy is more ambiguous, EI should be more likely to be activated because employees with higher levels of EI may be motivated to proactively seek meaning out of the ambiguous situation and cognitively pursue safety control. Future research may consider additional moderators, both task- and organisation-focused, to identify the conditions that promote or hinder EI from influencing safety-related outcomes.

Third, we did not control for some variables that may have confounded our proposed relationships. For example, existing research suggests that safety-specific orientations such as safety motivation (i.e., one's willingness to commit to safety behaviours) (Neal and Griffin (2006) and risk-taking orientation (Westaby & Lowe, 2005) affect safety performance. It has also been reported that characteristics such as trait mindfulness can influence situational awareness (Zhang et al., 2013). Future research should consider controlling for some of these

confounders to explore whether EI or similar constructs can incrementally explain the variation of situational awareness and safety performance.

Fourth, we focused on situational awareness as a single conditional, mediation mechanism of the EI–safety performance linkage. Although this focus has verified the view that the link between EI and safety performance tends to be indirect, situational awareness might not be the only path through which EI can influence performance. The literature suggests that EI may promote positive and alleviate negative psychological states that are related to employees' well-being and thereby affect their performance (Mattingly & Kraiger, 2019; Sánchez-Álvarez et al., 2016). It might be worthwhile for future research to examine well-being-related constructs such as burnout, engagement, and thriving at work as mediation mechanisms, as well as explore the associated boundary conditions.

Finally, our sample was gender biased. Female pilots accounted for only 2.30% of our respondents, and thus our results might be more applicable for male pilots and not be generalised to females specifically. However, the gender bias was within the expectation, for female commercial pilots only account for 1.28% of the total pilot population in China (Brenda, 2018).

Given that our sample size was relatively small and had a greater proportion of females than the national average, we conclude that the sample is representative in terms of gender. Considering that this female population is very small, future research may consider qualitative approaches to investigating the phenomena related to EI and safety if the experience of Chinese female commercial pilots is to be explored.

Chapter 6

Why and When Do Emotionally Intelligent Employees Perform Safely? The Roles of Thriving at Work and Career Adaptability

Note: Chapter 5 is a manuscript that has been published by the Journal Applied Psychology. I use “we” in this chapter, in respect for my coauthors. For my individual contribution, please see “Authorship Declaration”.

Abstract

Based on the socially embedded model of thriving, the present study examined a moderating mediation framework, which involves the mediating role of employee thriving and the moderating role of career adaptability in the relationship between Emotional Intelligence (EI) and safety performance. A two-wave survey was administered among full-time commercial pilots working for airlines (N=131). Our results showed that EI had a positive influence on employee thriving, which in turn positively affected safety performance. In addition, the results further revealed that the positive effect of EI on safety performance was stronger among pilots with a higher level of career adaptability. These findings have important implications for theoretical developments on EI, thriving, and performance in a safety context, and they also provide practical insights on how to enhance workplace safety.

Keywords: emotional intelligence, career adaptability, thriving, and safety performance

Introduction

Past research on human factors has shown that individuals' unsafe behaviours account for a significant proportion of incidents and accidents at the workplace (Ioannou et al., 2017; Kvalheim & Dahl, 2016; Luo et al., 2017). This raises the importance of continued efforts to study the safety-related behaviour of personnel and to find effective strategies for enhancing safety performance. As per Griffin and Neal (2000), safety performance is considered to include safety compliance and safety participation, which denote two key types of the individual's safety behaviours. Specifically, safety compliance refers to the engagement in compulsory tasks that individuals have to complete to maintain workplace safety. The core compliance activities include behaviours such as following safe work procedures and wearing personal protection equipment at the workplace. Safety participation refers to attending to non-compulsory safety-related tasks that can help to support workplace safety. The core participation activities include behaviours such as helping co-workers with safety-related jobs and voluntarily attending safety meetings. These two types of safety-related performance work as a whole concept to reflect an individual's daily safety activities. Considering the severe consequences of unsafe performance, scholars have explored numerous antecedents that can impact safety performance, such as safety climate (Guo et al., 2016; Neal & Griffin, 2002), safety leadership (Clarke, 2013), job characteristics (Turner et al., 2012), and personality differences (Hogan & Foster, 2013).

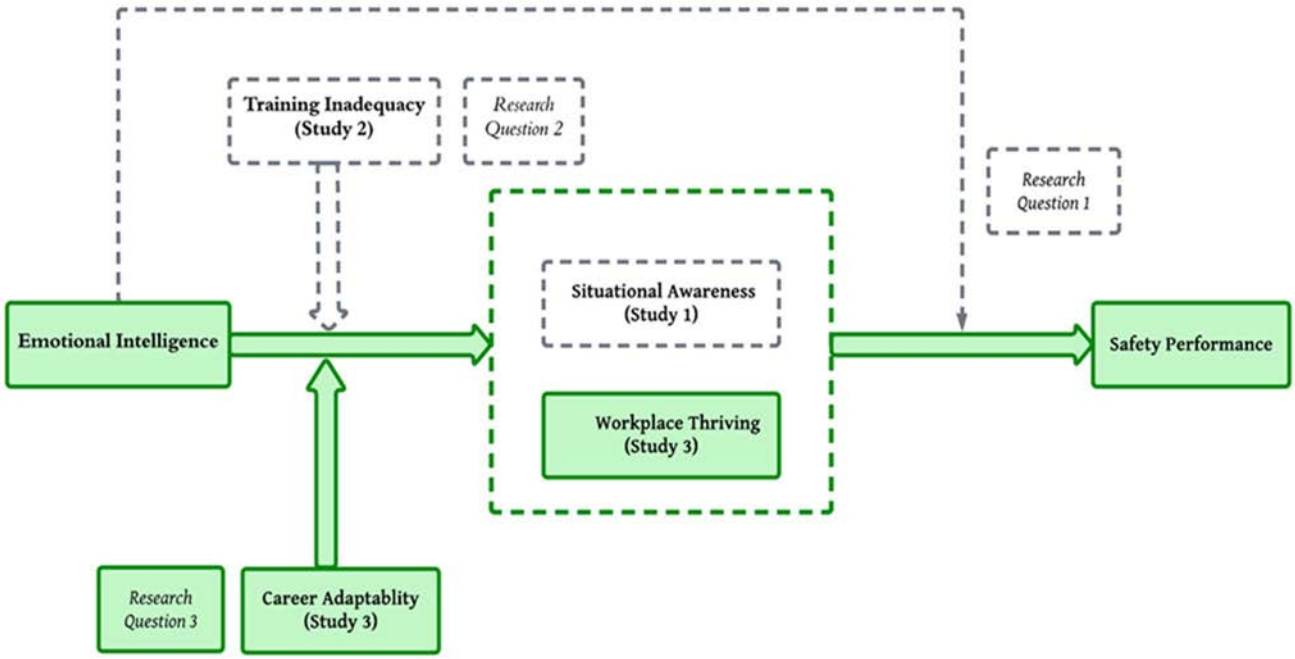
Recently, researchers have started to investigate the influence of emotional intelligence (EI) on workplace safety and found significant positive impacts on occupational health and safety (Ifelebuegu et al., 2019; Olawoyin, 2018; Sunindijo & Zou, 2013; Sunindijo & Zou, 2012). EI refers to an individual's ability to recognise one's own and others' emotions, understand emotions, use emotions to guide thinking, and regulate emotions to promote growth (Mayer et al., 2011). Previous research showed that emotionally intelligent

individuals tend to stick to the safety principles and prefer not to undertake high-risk behaviours that will jeopardise safety. The explanation rests on the fact that high-EI individuals have strong self-awareness of their strengths and weaknesses and can effectively control their behaviours regardless of pressure, stress, changes, or other adversities. Similarly, Jeffries (2011) suggested that emotional intelligence facilitates positive safety-related attitudes that can lead to genuine safe work behaviours, such as adhering to safety rules, following safety procedures, and helping to solve safety issues.

Although these studies shed some light on the relationship between EI and safety performance, the underlying mechanism for this relationship remains less clear. There is limited research that has attempted to explain why or how EI contributes to workplace safety. For example, Sunindijo and Zou's (2013) study focused on the effect of EI on promoting leaders' safety management skills so as to improve overall safety performance (e.g., enhanced safety climate). More recently, Wang et al. (2021) examined the cognitive ability to sense situations as a mechanism linking EI to employees' safety performance. Although this emerging empirical work has contributed to our understanding of the cognition- and/or capability-based processes behind the effect of EI on safety performance, some key questions remain unanswered. For instance, given that EI is an emotion-related attribute, do employees' emotional or affective experiences also constitute part of the mechanism that explains the EI and safety performance linkage? Also, besides contextual resources or constraints examined previously (e.g., Wang et al., 2021), is EI intertwined with other personal resources that benefit employees' psychological experiences for better performance? These areas are unfortunate omissions in the literature, for EI impacts not only cognition but also affect (Kafetsios & Zampetakis, 2008), and individuals differ in their capabilities or motivations to leverage EI to their advantage. Unless these questions are answered, we will remain unable to gain meaningful insights on how to enhance safety performance from the EI perspective.

In this research, we aim to answer these questions by testing a moderated mediation framework, which looks at the EI-safety performance linkage from a thriving perspective (Figure 6.1). First, rooted in a socially embedded model of thriving (Spreitzer et al., 2005), we examine thriving at work as a potential mediation mechanism underlying the relationship between EI and safety performance. Thriving refers to a positive psychological state denoting an individual's joint feeling of vitality and learning. We consider thriving because it is a combination of cognitive (i.e., learning) and affective (i.e., vitality) components, and this nature enables us to address the shortcomings in prior studies (e.g., Sunindijo & Zou, 2013; Wang et al., 2021) by capturing a potential mechanism that integrates both cognition and affect. In fact, thriving serves as a subjective self-appraisal guide for estimating how one is doing and whether one is making improvements in a positive direction. This positive psychological state prompts individuals to concentrate on their in-role work, especially on critical tasks (e.g., safety-related tasks) requiring more attention. This is evidenced in the finding that thriving positively predicts desirable workplace outcomes, particularly high-quality in-role performance (Kleine et al., 2019; Paterson et al., 2014; Wallace et al., 2016). Meanwhile, an individual who experiences thriving cares about what is happening around them and actively supports co-workers, and thus such an individual may be likely to go beyond normal duties to promote a safe work environment (e.g., safety participation). Theoretically, EI enables an individual to thrive by keeping him/her sufficiently emotionally positive to engage in agentic behaviours, such as retaining focus on what he/she is doing, exploring new things (e.g., new objects, changes, novel solutions) at work, and looking out for his/her own and others' needs (Spreitzer et al., 2005). As per these perspectives, thriving may be enabled by EI, and it could also potentially promote safety engagement. Thus, we argue that EI can impact individuals' safety performance through thriving.

Figure 6.1 Research Model -Study 3



Second, our conceptual model features career adaptability as a boundary condition (i.e., moderator) for the effect of EI on employee thriving and subsequently on safety performance. As the core construct of career construction theory, career adaptability refers to one's psychological capability to adapt to dynamic changes in work and career settings and consists of concern, control, curiosity, and confidence in professional contexts (Savickas & Porfeli, 2012). Integrating career construction theory into a socially embedded model of thriving, we consider the moderating role of career adaptability in the mediation chain that is driven by thriving. The reason is that, as a motivational resource, career adaptability can motivate people to leverage existing individual strengths (e.g., EI) to reach desirable states (Guan et al., 2014), which drive their forward development or positive changes of behaviours. Scholars also argue that the functioning of EI may be subject to certain personal attributes or capabilities and the person-environment interaction (Coetzee & Harry, 2014; Schutte et al., 2008), which is the core notion of career adaptability e.g., the emphasis on the individual's adjustment to the environment (Savickas, 1997, 2002). On these bases, we

suggest that career adaptability, constructed as a set of self-regulatory capacities in environmental adaptation, may stimulate EI's functioning in promoting positive affective and cognitive experiences in safety-critical contexts which are challenging and require intense attention. As suggested by some researchers (Ocampo et al., 2018), individuals with high-level career adaptability are concerned about, and are confident with, their own growth at work. These characteristics lead them to actively take adaptative strategies (e.g., mobilizing personal resources such as EI-related skills) to prepare for upcoming changes and challenges, which may involve affective reactions, and to pursue sustainable improvement, which involves learning. Based on these points, we further contend that career adaptability can strengthen the role of EI in shaping employees' thriving state, which promotes their safety performance.

In summary, applying the socially embedded model of thriving (Spreitzer et al., 2005) and career construction theory (Savickas, 1997, 2002) to explain the relationship between EI and safety performance, we examine employee thriving as a mediator and career adaptability as a moderator. This study makes several important contributions to the literature. First, by examining the mediation effect of thriving, the study reveals a new mechanism that explains how EI can influence one's safety performance. By capturing both affective and cognitive states, this mechanism extends the literature, which is currently limited to cognition- and capability-driven processes (e.g., Sunindijo & Zou, 2013; Wang et al., 2021). In doing so, it is among the earliest to provide findings that justify EI as a potential enabler of employee thriving. Second, by investigating the moderating role of career adaptability, this study has identified a new boundary condition underlying the relation between EI and safety performance through thriving. This boundary condition not only complements prior literature focused on contextual moderators of the effect of EI on performance and behaviour but also serves as an empirical foundation to integrate careers theories and Spreitzer et al.'s thriving

model to interpret the development of safety performance. At a practical level, the present study can enlighten managers regarding how they can draw upon employees' personal and career resources to foster a workforce that is committed to safety performance.

EI, Thriving at Work, and Safety Performance

We propose that thriving at work can help explain why EI may influence employees' safety performance. We first theorise the relationship between EI and thriving, and then we discuss the relationship between thriving and safety performance. Thriving at work is an important positive psychological state that drives employees' development, growth, and performance. It is a positive subjective experience where individuals feel vitality and learning simultaneously. That is, thriving denotes a condition in which one feels enjoyment and energy from his/her work, and learns and applies new knowledge and skills to enhance self-development to a higher level. Validity and learning are two critical components that both need to exist to constitute a thriving stage. Lacking one of these two conditions, an individual cannot experience a sense of thriving (Porath et al., 2012). For example, when an individual is full of energy when performing his/her job tasks but is not learning new things or gaining new knowledge, he/she is not thriving. In contrast, one may be gaining new knowledge and skills at work but hardly feel invigorated, energetic, or inspired; such an individual is not thriving, either (Spreitzer et al., 2005).

EI has been defined as the personal capability to appraise one's own and others' emotions, regulate emotions, and use emotions to guide thinking, decision-making, and behaviour (Salovey & Mayer, 1990). We expect EI to promote employee thriving for several reasons. First, emotionally intelligent individuals are likely to experience positive rather than negative emotions (Kafetsios & Zampetakis, 2008), and they therefore have a greater tendency to feel energetic and vital at work and to be psychologically ready to learn new things (Kleine et al., 2019). Researchers suggest that employees with higher EI have greater

flexibility and stronger capabilities to manage undesirable emotions (e.g., tension, nervousness, frustration, and anxiety) and thus are better able to stay emotionally positive (Zeidner et al., 2004). highlighted the critical roles of positive emotions in fostering individuals' long-term flourishing. When experiencing positive emotions, individuals are driven to expand thinking and behave actively to approach resources in an uptrend way, and ultimately to thrive (Spreitzer et al., 2005). Indeed, encountering setbacks or challenges at work (e.g., demanding workload, stressful deadlines, and tense co-worker relationships) may cause unpleasant emotional experiences (e.g., anxiety, frustrations, and anger), which can consume individuals' mental energy and prevent them from thriving. However, in this situation, emotionally intelligent individuals, being self-sufficient in managing negative emotions and emotional fluctuations, would thus be better able to sustain their energy, which is needed for them to thrive.

Second, high emotionally intelligent employees are likely to undertake agentic actions that enable them to gain energy and learning at work. A socially embedded model of thriving (Spreitzer et al., 2005) highlights that personal resources prompt employees to engage in agentic behaviours such as heedful relating, exploration, and task focus, which are essential enablers of thriving. EI can potentially trigger employees' engagement in these agentic actions. For example, emotionally intelligent employees tend to create a comfortable work environment that enables them to sustain passion about their job and enjoy learning to grow by heedfully establishing high-quality quality relationships with co-workers and supervisors (Sears & Holmvall, 2010). These relationships represent motivational social exchange resources at work, which have been found to positively influence thriving (Walumbwa et al., 2020). In addition, as EI can compensate for the limitations of cognition capability and offers new ways of reasoning, thinking, and solving problems (Mayer et al., 2016), employees with higher EI may be more likely to explore new things at work (e.g., experimenting with new

ways of performing tasks or managing working relationships). In line with this view, empirical research (Hahn & Lee, 2013) has reported a positive effect of EI on workplace exploration, which is defined as one's pursuit and experimentation of new knowledge and things yet to be known. Furthermore, given that EI helps employees effectively deal with the adverse effects of unstable emotions (Mayer et al., 2016) and facilitates their use of emotions to achieve goals (Wong & Law, 2002), those with stronger EI may encounter fewer obstacles, and have greater motivation, to focus on work tasks (Rode et al., 2007). Engaging in these active, purposeful behaviours (i.e., heedful relating, exploration, and task focus) allows them to gain new knowledge and develop a sense of vitality, and thus become thriving. In brief, this line of reasoning suggests that employees with higher EI are more likely to thrive.

Hypothesis 1: EI has a positive relationship with thriving at work.

It is vital to enable employees' thriving because thriving individuals usually exhibit positive work outcomes. Thriving at work leads individuals to sense the meaning of their job, directs them to accomplish their in-role and extra-role tasks above a high standard, and contributes to a positive social environment (Spreitzer et al., 2005; Zhang et al., 2019). Empirical researchers have reported the impacts of thriving on individuals' work performance. For example, Elahi et al. (2020) confirmed that employees with continuous, high-level thriving showed intense task engagement and gained higher performance ratings (Porath et al., 2012). Furthermore, some studies also found that thriving employees tend to perform better on job tasks (in-role performance) and engage in organisational citizenship behaviour (extra-role, contextual performance) (Kleine et al., 2019). The literature is clear that maintaining employees in a thriving status at daily work is desirable for both employers and employees as it is an essential factor to improve productivity, efficiency, and performance at both the organisation and individual levels (Porath et al., 2012; Usman et al., 2020). However, the existing studies on thriving have primarily focused on general or overall

work performance, either in-role or extra-role, and have yet to reveal the roles of thriving in affecting specific domains of performance in contextualised settings. For example, to date, a meagre few studies have examined the influence of thriving on safety performance, a critical, specific aspect of work performance, which needs special attention in safety-critical work contexts (Neal & Griffin, 2006). To contribute to this area, in this study, we argue that employees who are more thriving tend to perform better in safety-related contexts.

Safety performance consists of two interrelated components, safety compliance and safety participation (Neal & Griffin, 2006). Safety compliance involves one performing the core, compulsory tasks directly related to safety, and it reflects the in-role (task) nature of performance. Safety participation involves a person voluntarily performing the activities that are beyond normal work duties to promote safety in the workplace, and it reflects the extra-role (contextual) nature of performance. (Neal & Griffin, 2006) claim that motivation, knowledge, and skills are proximal enablers of safety performance. Safety compliance requires an individual to apply specific safety expertise, knowledge, and skills and to correctly apply these following safety instructions to maintain safe operation (Griffin & Curcuruto, 2016). Thriving individuals are in a state in which they are continuously learning and feeling vital (Spreitzer et al., 2005). While learning allows them to gain the required knowledge and skills that are needed to comply with safety procedures in core work tasks, vitality may provide them with strong motivational energy that enables them to apply the acquired knowledge and skills to ensure workplace safety. Although there is no direct empirical evidence, past research in general work performance offers some indirect support. For example, prior studies have found that thriving enhances individuals' work engagement and leads them to a higher level of task performance. Based on this line of argument, we suggest that thriving can prompt safety compliance, for thriving individuals are engaged in

learning and are full of psychological energy and thus can develop better knowledge/skills and motivation to comply with safety instructions and procedures.

Likewise, safety participation, which refers to the indirect safety-related activities in which employees volunteer to be involved in order to help maintain work safety (Griffin & Curcuruto, 2016), also requires one to develop safety-related knowledge, skills, and motivations to go beyond compulsory safety requirements. As stated earlier, thriving employees can gain safety expertise when they are engaged in learning. Beyond expertise, voluntary activities require extra contribution and sometimes sacrifice of personal time and interests, and thus they require employees to have sufficient energy that can motivate their engagement in these extra-role activities. Thriving, which is characterised by high-level vitality, might be able to provide this motivational energy for employees' voluntary participation in promoting safety. Walumbwa et al. (2018)have shown that thriving enhances individuals' affective commitment to the organisation as they experience continuing growth, and as a result, they are willing to improve their performance to ensure consistency with this emotional attachment/bond. Taking part in voluntary activities is a good way to give back to the organisation. Many studies have verified that thriving employees exhibit active participation in voluntary work. Following this rationale, in a safety context, individuals who are thriving may be willing to put extra effort into working toward safety goals. Considering the potential role of thriving in fostering safety compliance and participation, we expect thriving to exhibit a positive relationship with safety performance.

Hypothesis 2: Thriving is positively related to an individual's safety performance.

As discussed above, EI has the potential to promote employees' thriving at work. When employees become thriving, they may be able to perform effectively in a safety context. Therefore, EI may enhance employees' safety performance via enabling their thriving experiences. Thus, we propose a mediation hypothesis:

Hypothesis 3: Thriving can mediate the relationship between EI and safety performance.

The Moderating Role of Career Adaptability

Jordan et al. (2010) argue that the influence of EI on work-related performance can be subject to some boundary conditions. For instance, Cote and Miners (2006) found that EI can improve work performance by compensating for insufficient cognitive intelligence. In such a case, the incremental predictive variance of EI on work performance increases when the cognitive level decreases. Focusing on contextual moderators, Wong and Law (2002)study showed that EI has higher predictive validity on work performance in a more emotional context. Farh et al. (2012) also showed that the EI–performance relationship becomes more positive as managerial work demands increase. This existing body of work has focused on the main or indirect effect of EI on work-related outcomes, primarily attending to boundary conditions that are closely related to one's general attributes and work contexts. Extending this work, we explore the potential moderating role of career adaptability on the effect of EI on thriving and subsequently on safety performance.

Career adaptability refers to individuals' adaptability to cope with workplace changes, master challenging situations, and managing career difficulties (Savickas, 1997). To measure individuals' ability to adjust to changes at the workplace, such as role transitions, career trauma, and turnover, Savickas and Porfeli (2012) framed career adaptability as a construct of four dimensions, including career concern (caring about future task changes), career control (taking responsibility for one's own career development), career curiosity (exploring work and career possibilities and opportunities), and career confidence (believing in one's own abilities to realise career goals). These four aspects are unified as a whole construct that has been proven to be positively related with positive employee outcomes such as job satisfaction, work engagement, and work performance (Hamtiaux et al., 2013; Ohme &

Zacher, 2015; Rasheed et al., 2020). Research suggests that career adaptability can facilitate individuals in maximising the benefits of motivational self-concept and minimising the detrimental effects of undesirable personal attributes on their employment and work outcomes (e.g., Amarnani et al., 2020; Savickas, 1997). This function of career adaptability denotes its role in enlarging the positive influence of one's motivational personal characteristics on his or her work status.

Our earlier discussion indicates that EI, which is motivational in nature (Wong & Law, 2002), promotes individuals to engage in agentic behaviours that enable them to thrive. As career adaptability increases, they are better able to manage the difficulties and challenges in career and work settings (Guan, Zhou, et al., 2015). This helps smooth the process for high-EI employees to engage in the active, purposeful behaviours needed for achievement of a thriving state. A main reason is that career adaptability equips employees with abundant self-regulatory resources that prevent them from getting stuck in unpleasant emotional experiences. As Fiori et al. (2015) found, individuals with strong career adaptability tend to develop positive emotions and are less likely to experience negative emotions. From this perspective, individuals with higher career adaptability may be in a better psychological (affective) condition to leverage EI to pursue a thriving status through undertaking agentic behaviours. This is to some extent consistent with the scholarly assertion that career adaptability makes individuals willing and able to engage in behaviours that can keep them psychologically positive, and they tend to take advantage of various existing personal resources or attributes to make this happen (Guan et al., 2014). For example, when people have strong career adaptability, they might be willing and able to utilise their EI to assist with agentic behaviours (e.g., heedfully establishing high-quality relationships with others at work), which enable them to thrive. Conversely, even when individuals are emotionally intelligent, they may not be able or adaptive (willing or motivated) to leverage their EI in this

process if they do not have sufficient career adaptability resources to do so. This conjecture is further consolidated by existing studies that found career adaptability to be a moderator that strengthens the relationship between motivational individual characteristics and positive psychological states (e.g., Gong et al., 2018; Guan et al., 2014). As such, we predict that career adaptability can enhance the relationship between EI and thriving.

Hypothesis 4: Career adaptability moderates the relationship between EI and thriving such that this relationship will be stronger when career adaptability is high rather than low.

According to our elaborations above, EI could potentially lead to an employees' sense of thriving at work, which in turn may enable them to demonstrate higher safety performance (Hypothesis 3). Also, career adaptability has the potential to strengthen the effect of EI on thriving (Hypothesis 4). Integrating these propositions indicates a potential moderated mediation, which denotes conditional indirect effects of EI on safety performance via thriving across low and high levels of career adaptability. As highlighted earlier, career adaptability might serve as a moderator that accelerates the positive effect of EI. Thus, we expect that the indirect effect of EI on safety performance via thriving will be stronger when career adaptability is higher.

Hypothesis 5: Career adaptability will moderate the mediating relationship between EI and safety performance such that the relationship is stronger for individuals having relatively higher-level career adaptability than for individuals having relatively lower-level career adaptability.

Methods

Participants and Procedure

The data of this study were collected from full-time commercial pilots at airlines in mainland China via a two-wave survey. Participants were recruited via the lead author's professional network and responded to either online or paper questionnaires. The lead author

contacted a fleet manager of an airline who assisted with promoting this study to other airlines. For the online questionnaire, the potential participants were sent invitations containing a hyperlink to the survey. Paper questionnaires were placed in envelopes and distributed to participants in a meeting room at their company headquarters when they were not flying. At Time 1, the pilots responded to demographic characteristics and answered questions regarding EI, thriving, and career adaptability. At Time 2, about one month after Time 1, they finished the second short questionnaire, which included the measure of safety performance. Ethical approval for this study was obtained from the institution of the lead author.

Two hundred and eleven pilots returned usable surveys at Time 1, representing 79.3% of those who received the survey. One hundred and sixty-one pilots (76.3%) sent back valid responses. Using unique codes created by the participants, we successfully matched data for 133 participants who answered both surveys. The majority (97.7%) of this sample were male pilots. They had a mean age of 28.7 years (SD = 4.1) and a mean job tenure of 38.9 months (SD = 41.3). All held at least a higher education qualification.

Measures

The measures we used for the variables in this study were originally written in English. A back-translation approach (Brislin, 1980) was applied to translate them into a Chinese version. Participants responded to the measurement items on a five-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5), unless otherwise specified.

EI. Wong and Law's (2002) measure of emotional intelligence was used to assess participants' self-perceived EI capabilities. This measure included four aspects that reflect an individuals' self-perceived EI: appraisal of one's own emotions, appreciating others' emotions, regulation of emotions, and using emotions to achieve goals. Example items were

"I am a good observer of others' emotions" and "I am able to control my temper and handle difficulties rationally". The Cronbach's α was .89.

Thriving. Six items by Jiang (2017) measured pilots' thriving at work. This six-item scale of thriving was developed through Jiang's adaptation of Porath et al.'s (2012) ten-item scale to fit the Chinese context. An example item was "I feel very energetic". The Cronbach's α for thriving was .87.

Safety performance. We used Griffin and Neal's (2000) seven-item scale to measure pilots' safety performance at work. Example items were "I use the correct procedures for carrying out my job" and "I voluntarily carry out tasks or activities that help improve workplace safety". The Cronbach's α was .93.

Career adaptability. The twenty-four items developed by Savickas and Porfeli (2012) were employed to measure individuals' career adaptability, which included their career concern, career control, career curiosity, and career confidence. Example items were "Thinking about what my future will be like", "Making decisions by myself", "Probing deeply into questions I have", and "Working up to my ability". Participants indicated how strongly they had developed the capabilities described in these items on a five-point Likert-type scale ranging from *not strong* (1) to *strongest* (5). The Cronbach's α was .89.

Control variables. The literature suggests that gender, age, and job tenure could potentially impact the mediating and outcome variables of this study. For example, using a Chinese sample, found that older individuals tended to be less thriving at work. In a study by, male employees were found to be more likely to thrive than their female counterparts, particularly in terms of the learning component of thriving. In addition, Hu et al. (2016) reported that employees with longer job tenure were less likely to comply with safety procedures at work. Xia et al. (2018) showed that older workers demonstrated lower levels of safety participation. In consideration of these findings, this study controlled these variables in

the data analysis. Furthermore, because the safety performance was self-reported by the pilots, there was the potential for their self-rated performance to be subject to social desirability. We used Hays et al.'s (1989) 5-item measure to assess social desirability, which was intended to be used to explore if self-reported safety performance would be biased by participants' personal preference to overrate their own behaviours that are socially desirable. According to some researchers (e.g., Cheng et al., 2012), the impact of social desirability is negligible if the results remain similar even if social desirability is controlled for. An example item is "I sometimes try to get even rather than forgive and forget" (reverse coded). The Cronbach's α for social desirability was .63.

Data Analysis

Following Bernaards and Sijtsma (2000), missing data were processed by multiple imputation. For example, if a participant missed a few but not all items for a particular variable, the missing values were replaced based on the full information maximum likelihood (FIML). Participants who missed all items for a variable were excluded from the analyses. After the screening, three participants that missed demographic information were excluded, leading to 130 participants being used for confirmatory factor analysis (CFA) and 127 participants included in correlational tests and hypothesis testing.

First, we conducted CFA in AMOS to test if our four focal variables (i.e., EI, thriving, career adaptability, and safety performance), which were measured by multiple items, could be distinguished. Given that our sample size was relatively small while having a relatively large number of measurement items, we followed Little et al.'s (2002)advice and created item parcels to minimise inflation errors. Four parcels were created for EI and career adaptability respectively, and two parcels were created for safety performance. The moderation hypothesis (Hypothesis 4) was examined using hierarchical regression analysis. The

mediation and moderated mediation hypothesis (Hypotheses 1–3 and Hypothesis 5) were tested with PROCESS for SPSS (Hayes, 2013).

Results

Confirmatory Factor Analysis (CFA)

According to the CFA results, EI, career adaptability, thriving, and safety performance were distinct constructs in our data. These results are shown in Table 6.1. In light of prior research (e.g., Hu & Bentler, 1999), it can be claimed a model will fit the data if most of these criteria are met: RMSEA < 0.08, SRMR < 0.08, and CFI > 0.90. In this study, the four-factor model ($\chi^2 = 74.55$, $df = 48$, $p < .01$, RMSEA = .07, SRMR = .05, CFI = .97) met these criteria, suggesting a good model fit. Chi-square difference tests showed that the model fit of the four-factor model was significantly better than that of the alternate models. These results provided clear evidence that EI, thriving, career adaptability, and safety performance could be distinguished in our study. Therefore, these variables could be examined as separate variables in the following analyses.

Table 6.1

Confirmatory Factor Analysis (CFA) Results

Models	χ^2	*df*	$\Delta\chi^2$	Δdf	χ^2/df	SRMR	RMSEA	CFI
4-factor model	**74.55***	**48**	**---**	**---**	**1.55**	**.05**	**.07**	**.97**
3-factor model A (EI and thriving were combined)	108.66***	51	34.11***	3	2.09	.07	.09	.93
3-factor model B (thriving and SP were combined)	217.14***	51	142.59***	3	4.26	.09	.16	.78
3-factor model C (EI and CA were combined)	82.87***	51	8.32***	3	1.62	.06	.07	.96
3-factor model D (CA and SP were combined)	232.89***	51	158.34***	3	4.67	.10	.17	.76
3-factor model E (EI and SP were combined)	226.57***	51	152.02***	3	4.44	.10	.16	.77
3-factor model F (CA and thriving were combined)	116.86***	51	42.31***	3	2.29	.07	.10	.91
2-factor model A (EI and CA were combined; thriving and SP were combined)	224.84***	53	150.29***	5	4.24	.10	.16	.77
2-factor model B (EI and thriving were combined; CA and SP were combined)	261.46***	53	186.91***	5	4.93	.11	.17	.73
2-factor model C (EI and SP were combined; thriving and CA were combined)	264.94***	53	190.39***	5	5.00	.11	.18	.72
1-factor model (EI, CA, thriving, and SP were combined)	271.46***	54	196.91***	6	5.03	.11	.18	.71

Note. N=130, after excluding three cases with missing data. EI = emotional intelligence, CA = career adaptability, and SP = safety performance.

*$p < .05$, ***$p < .001$.

Descriptive Statistics

The mean, standard deviations, and correlations of our control and key variables are shown in Table 6. 2. EI was significantly and positively associated with safety performance (r = .25, p < .01) and thriving at work (r = .49, p < .001). As expected, there was also a significant, positive correlation between thriving at work and safety performance (r = .30, p < .01).

Table 6.2

Means, Standard Deviations, and Correlations

Variables	Mean	SD	1	2	3	4	5	6
1. Gender	0.98	0.15						
2. Age	28.74	4.11	.00					
3. Job tenure (months)	39.24	41.74	.00	.66**				
4. Emotional intelligence	3.88	0.50	-.02	-.17	-.17			
5. Career adaptability	3.88	0.69	-.05	-.25**	-.22*	.67**		
6. Thriving	3.99	0.60	.07	.24**	-.28**	.50**	.54**	
7. Safety performance	4.32	0.72	.03	-.06	-.03	.25**	.20*	.30**

Note. N = 127. We implemented listwise deletion. Gender: male = 1; female = 0.

*p < .05, **p < .01.

Hypothesis Testing

Results of regression analyses are presented in Table 3. Demographic variables including age, gender, and tenure were controlled in all analyses. As reported in Table 6.3, EI was positively related to thriving (Model 1: β = 0.45, p < .001). Thus, Hypothesis 1 was supported.

Table 6. 3

Results of the Mediation Model (Hypothesis 1, 2, and 3)

Dependent variables	Thriving *(Model 1)*	Safety performance *(Model 2)*
Gender	.08	.01
Age	-.05	-.04
Job tenure (months)	-.17	.09
Emotional intelligence (EI)	.45***	.14
Thriving		.24*
R^2	.28	.11
df1, df2	4, 122	5, 121
F	12.27***	2.95*

Indirect Effect (bootstrap)	*B*	*SE*	*95%CI*
EI → thriving → safety performance	0.16	0.07	[0.03, 0.30]

Note. N = 127. We implemented listwise deletion and reported standardised coefficients Models 1 and 2. CI: Confidence interval. Bootstrap samples = 5000.

*$p < .05$, **$p < .01$, ***$p < .001$.

Hypothesis 2 proposed that thriving would have a positive impact on individuals' safety performance. In Model 2, we added thriving into the regression, and the coefficient for the effect of thriving on safety performance was significant (Model 2: $\beta = 0.24$, $p < .05$). As such, Hypothesis 2 was supported.

Next, we used Hayes's (2013) PROCESS for SPSS to test the mediating effect of thriving on the relationship between EI and safety performance. We employed 5,000 bootstrap samples with the 95% bias-corrected confidence interval (CI) to test the indirect effect. The results showed a significant indirect effect of EI on safety performance via thriving (B = 0.16, Boot SE = 0.07, 95%CI = [0.03, 0.30]), demonstrating that thriving

mediated the relationship between EI and safety performance. Therefore, Hypothesis 3 was supported.

Hypothesis 4 predicted that career adaptability would moderate the relationship between EI and thriving. We applied a three-step hierarchical regression to analyse the potential moderating effect. As shown in Table 6.4, control variables (age, gender, and tenure) were entered in Step 1 and EI and career adaptability was entered in Step 2. The interaction term of EI and career adaptability was entered in Step 3. To reduce the potential multicollinearity, both EI and career adaptability were mean-centred before calculating the interaction and before their entry into the regression equation. The results showed that the interaction effect of EI and career adaptability on thriving was significant ($\beta = 0.25$, $p < .01$), which suggested that the moderating role of career adaptability potentially existed. To further explore the direction of the moderation, we depicted the moderating effect of career adaptability adopting Dawson's (2014) procedure. Specifically, we plotted the effect of EI on thriving one standard deviation below and above the mean of career adaptability (Figure 6.2) and calculated the simple slopes. The simple slope analysis demonstrated that the relationship between EI and thriving was stronger when career adaptability was high (slope = 0.43, $p < .001$) rather than low (slope = 0.16, *n.s.*). These results supported Hypothesis 4.

Table 6.4

Results of the Moderating Effect (Hypothesis 4)

	Thriving		
	Step 1	Step 2	Step 3
Gender	.07	.09	.09
Age	-.09	-.00	.01
Job tenure (months)	-.22	-.16	-.14
Emotional intelligence (EI)		.23*	.24*
Career adaptability		.35***	.44***
EI × Career adaptability			.25**

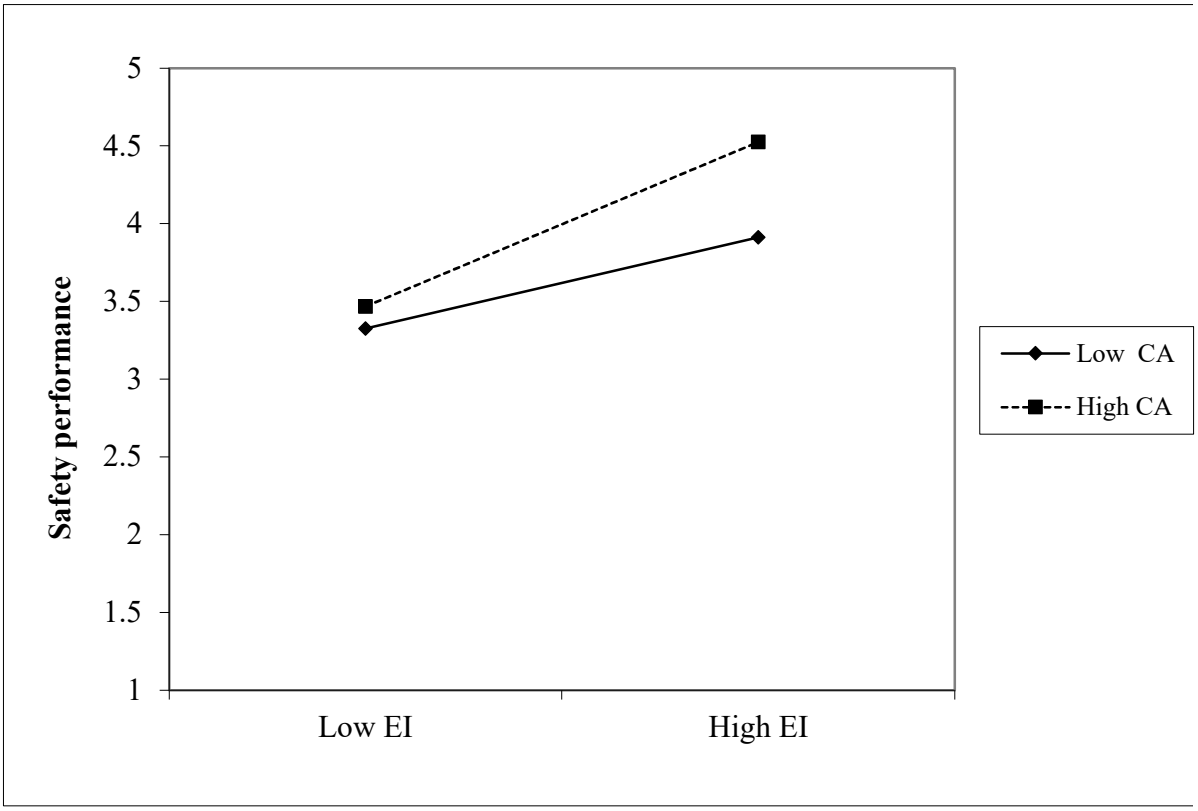
R^2	.09	.35***	.40***
ΔR^2		.26***	.05**

Note. N = 127. We implemented listwise deletion and reported standardised coefficients in this table.

*$p < .05$, **$p < .01$, ***$p < .001$.

Figure 6.2

The Moderating Effect of Career Adaptability on the Relationship between Emotional Intelligence and Thriving at Work



Hypothesis 5 expected that career adaptability would moderate the mediating effect of thriving on the relationship between EI and safety performance. In detail, the mediated relationship (i.e., the indirect effect of EI on safety performance via thriving) would be stronger for individuals with higher-level career adaptability. To examine this moderated mediation hypothesis, we employed Model 74 in PROCESS for SPSS (Hayes, 2013) with

5,000 bootstrap samples to assess the indirect effects of EI at higher and lower levels of career adaptability. Based on our results, the indirect effect of EI on safety performance via thriving was positive and significant when career adaptability was high (B = 0.12, boot SE = 0.07, 95% CI = [0.01, 0.29]), but not significant when career adaptability was low (B = 0.05, boot SE = 0.06, 95% CI = [-0.04, 0.20]). This result appeared to support our prediction that the indirect effect would be stronger when career adaptability was higher. However, the index of moderated mediation suggested that the difference between these two conditional indirect effects was not significant (index = 0.07, SE = 0.06, 95% CI = [-0.04, 0.16]). Accordingly, the evidence was not strong enough to fully support Hypothesis 5 . supported.

Table 6.5

Results of Moderated Mediation Effects (Hypothesis 5)

	B	Boot *SE*	95% *CI*
Conditional Indirect Effects			
Low-level career adaptability	0.05	0.06	[-0.04, 0.20]
High-level career adaptability	0.12	0.07	[0.01, 0.29]
Index of Moderated Mediation	0.07	0.06	[-0.04, 0.16]

Note: CI: Confidence interval. Bootstrap samples = 5000. Low and high career adaptability equals one standard deviation below and above the average of career adaptability, respectively.

Discussion

The current research used a sample of full-time commercial pilots in China to explore the relationships among EI, thriving, career adaptability, and safety performance. The results showed that thriving mediated the positive relationship between EI and safety performance. That is, emotional competencies facilitate individuals in maintaining energy and processing information in their surroundings (e.g., learning) to thrive at work, and in turn, the thriving

individuals are more likely to perform their core tasks better and also voluntarily participate in work-related activities in a safety context. In addition, the results demonstrated that the positive effect of EI on employee thriving was strengthened by career adaptability, as was the indirect effect of EI on safety performance through thriving. These findings extend the existing literature on safety performance in notable ways and provide important implications for practitioners.

Theoretical Implications

This research adds to the literature in several ways. First, by revealing the mediating effect of employee thriving (e.g., feel energetic and learn new things), this study extends the understanding of the process through which EI can facilitate an individual's safety performance. The identification of employee thriving as a new mechanism reveals that the effect of EI on safety performance occurs through a pathway wherein cognition and affect coexist, given that thriving is a combinative complex of cognitive (learning) and affective (vitality) components (Spreitzer et al., 2005). In doing so, this research is also among the earliest to provide empirical evidence that supports the function of EI in fostering employees' thriving experience, while also bridging the gaps in prior safety literature where the role of thriving is a missing area.

According to our findings, in safety-critical work settings, EI first contributes positively to the development of thriving experiences. With a sense of thriving fostered by EI, individuals are likely to following safety procedures and participate in building a safety culture or environment. These findings are largely consistent with, while not directly outlined in, a socially embedded model of thriving (Spreitzer et al., 2005), which highlights those personal resources (e.g., affective resources) can promote individual thriving, and they are also in accordance with the thriving model of human growth (Spreitzer & Porath, 2014), which emphasises thriving as an antecedent of individual performance. On the one hand, the

present findings imply that emotional management skills (e.g., EI) equip airplane pilots with the capability to keep and restore affective energy and the ability to cognitively process new information in their surrounding contexts (e.g., regulation and use of emotional cues), thereby fuelling themselves with nutriments for a sense of thriving (vitality/energy and learning). Also taking into account the socially embedded model of thriving (Spreitzer et al., 2005), there is a possibility that EI triggers their agentic behaviours (e.g., exploration, task focus, and heedful relating) to facilitate their energy acquisition/restoration and learning process as a path leading to a thriving state. On the other hand, the results to some extent reflect that thriving, as a positive psychological status, can not only provide energy for individuals to maintain a professional attitude toward work but also enable them to learn what needs to be done to perform tasks in a more efficient and productive way. That means that an individual's sustained vitality (energy) and learning together contribute to his or her positive work outcomes (e.g., safety performance). Taken together, this mediation model, which provides an alternative answer to the question why and how EI can impact safety performance, has further consolidated the view that the influence of EI on work performance occurs more indirectly than directly (Rode et al., 2007).

Second, by examining career adaptability as a boundary condition on the strength of the effect of EI on thriving in the safety context, this study contributes to the socially embedded model of thriving (Spreitzer et al., 2005) by suggesting that personal resources can intertwine to enable employee thriving. The influence of EI on thriving varies with the level of career adaptability. Our results suggest that career adaptability enhances the effect of EI on thriving. A possible explanation is that career adaptability serves as a self-adaptation source to cultivate individuals to take full responsibility for their own growth. Under this internal stimulation, individuals are also driven to leverage their personal resources and strengths (e.g., EI) to behave agentically to pursue positive growth (Guan et al., 2014), such as

focusing on their daily tasks, remaining curious and learning new things, maintaining good work relationships with colleagues, and seeking opportunities for further development (Spreitzer et al., 2005). These self-adaptation processes, elicited by the interplay of EI and career adaptability, may boost emotional and cognitive information processing to form a positive cycle of regulation–adaptation to grow when facing workplace changes. Consequently, emotionally intelligent individuals are more likely to experience higher levels of thriving when they are also vocationally adaptable, as manifested by their concern, curiosity, control, and confidence in work and career contexts.

Third, our findings show that the moderating effect of career adaptability is strong enough to extend its influence in a mediating relationship between EI and safety performance via thriving. This moderated mediation perspective has offered a more complex, finer-grained view about the influence of EI on safety performance by highlighting its mechanism and boundary condition. Specifically, the thriving mediated mechanism gets stronger among individuals who possess higher levels of career adaptability. Indeed, career adaptability reflects an individual's self-regulatory capability to maximise his/her potential to realise pre-set goals by implementing continuous active adaptation strategies (Johnston, 2018). High-level career adaptability individuals are aware and mindful of their own potential, and they are able to utilise their personal ability and resources (e.g., EI) to gain beneficial outcomes that keep them thriving when performing daily safety-related duties. Our findings suggest that these self-regulation-related characteristics of career adaptability may lead thriving to play a stronger role in translating the effect of EI to safety performance. The support for our moderated mediation model reflects a successful theoretical and empirical integration of career construction theory (Savickas, 1997, 2002) and the socially embedded model of thriving (Spreitzer et al., 2005) to explain the complex process through which EI facilitates safety performance.

Practical Implications

This study has important practical implications. Our findings indicate that EI and thriving are important predictors of an individuals' safety performance, and EI can facilitate the development of employee thriving. These results suggest that, to promote employees' compliance with and participation in safety-related behaviours, managers should endeavour to enhance employees' EI when it is feasible and to create a workplace where employees can thrive. One way might be to introduce EI-enhancement training courses for those employees who are deemed to possess low levels of EI, for previous research shows that EI can be improved by a targeted training program (Mattingly & Kraiger, 2019). Improving employees' EI may be an efficient but cost-effective strategy to improve safety performance and consequently reduce costs caused by the violation of safety-related procedures. In addition, attention should be paid to employees' sense of thriving, which, as per the results of the present study, can also enhance their safety performance. While the present findings highlight that the development of a thriving experience can benefit from a higher level of EI, past research has shown that thriving can also be stimulated by creating more positive work environments characterised by, for example, an open information-sharing environment and improved civility in the workplace. Thus, it would be helpful for managers to pay attention to strategies that can help shape these environmental characteristics in order to promote workplace thriving. Furthermore, the present study finds that career adaptability strengthens the positive effect of EI on safety performance via employee thriving. That means that career adaptability can accelerate the functions of EI in enabling thriving and thus in promoting safety performance. From this perspective, managers can also consider integrating elements that target career adaptability enhancement into the training programs. By incorporating both components of EI and career adaptability, these programs should be more effective in ensuring employees' thriving and safer behaviours.

Limitations and Future Research Directions, and Strengths

This study has several limitations that future research could further explore. First, although the participants answered in a two-wave survey, there is still a concern regarding common method bias. While the independent variable, EI, was collected at Time 1, employee thriving and safety performance were collected at the same time point (Time 2). As such, the relationship between thriving and safety performance may have been subject to common method bias. However, since our CFA results showed the four-factor model to have a better fit than the one-factor model and the three-factor model, in which thriving and safety performance were combined, the concern of common method bias is reduced. Nonetheless, future research should consider collecting three-wave data.

Second and relatedly, the data were cross-sectional in nature, which limited our conclusion about the causality among EI, thriving, and safety performance. Future research may adopt a longitudinal research design with repeated measures or an experiment to examine the relationship between these variables. For example, future researchers could conduct an interventional/experiment study to examine whether enhancing EI will improve employees' safety performance after a specified EI training program is introduced. This could be operationalisable, as past research shows that EI training can improve individuals' emotional abilities. Comparison of the results from two surveys collected prior to and after training may provide more accurate insights regarding whether individual safety performance can be enhanced following the EI training.

Third, we used self-report measures to assess individuals' safety performance. Although this scale has been widely used to measure safety performance and has proven to have high reliability and validity, self-report measures may suffer from respondents' inclination to give overly positive responses (Van de Mortel, 2008). Considering that safety performance is critical in some safety-centred industries, more objective approaches such as

observer ratings may provide advantages in evaluating individual performances more accurately. Future research may also consider applying supervisor ratings and accessing employee safety records to develop a comprehensive view of individuals' safety performances.

Fourth, we focused on the moderating effect of career adaptability at the personal level and empirically neglected the moderating role of the context. Indeed, the present research suggests that some situational and contextual factors at the organisational level can interact with EI to influence work outcomes (Desti & Shanthi, 2015). For example, exposure to a negative emotional climate (referring to predominant emotions that were perceived by group members) is likely to cause stress, which can result in occupational cognitive failure that in turn can lead to incidents. In such situations, individuals may activate their EI to conquer the adverse effects and maintain a positive mental status to focus on their tasks and avoid failure. At the workplace, job stress, which stems from job demands or other requirements (heavy workload, time pressure, work relationship, etc.), can also result in distraction, lost attention, cognitive processing failures, and a high possibility of making errors and mistakes (Barney & Elias, 2010; Jamal, 2007). When job stress increases, emotionally intelligent individuals should be able to seize the information in the changing situation and take active steps to control the potential adverse effects on his/her performance. Future research may consider boundary conditions at the organisation level to identify factors that strengthen or weaken the effect of EI on safety performance.

Fifth, our study only examined the mediation effect of thriving in the relationship between EI and safety performance. Previous research indicates that the relationship between EI and performance tends to be indirect (Ingram et al., 2019). Thriving might not be the only mediator between EI and safety performance. Earlier research suggests that EI can shape an individual's ability to process situational information and influence positive psychological

states that contribute to desirable results at work (e.g., Sunindijo & Zou, 2013). It might be worthwhile for future research to explore other mediation mechanisms, such as burnout, safety motivation, and mindfulness, as well as the associated boundary conditions.

Finally, our sample size was relatively small, and the participants were from the commercial aviation industry. A large portion of commercial pilots are employed in the general aviation industry, and they would share some common characteristics with commercial aviation while working in different flying environments. For example, the pilots may have graduated from the same flight training school, leading to the same educational background, but those working in the general aviation industry may operate unscheduled flights and, in many cases, work for much smaller airlines. Further research may consider collecting samples from these two different areas of the aviation industry and comparing the results to explore whether there are differences regarding the influence of EI on safety performance.

Conclusion

Based on the socially embedded thriving theory, we established a moderating mediation model to examine the influence of EI on safety performance through thriving, with a boundary condition of career adaptability. Our results support that EI is an important enabler of thriving that can improve safety-related behaviours, and the effect of EI is enhanced when career adaptability is high. This study makes significant contributions to the safety literature at the workplace by introducing the thriving-based mechanism to further our understanding of how the benefits of EI can be enhanced by personal resources (career adaptability) so as to promote thriving and improve safety performance. From a practical perspective, our findings suggest that organisations may provide EI and career adaptability training programs to enable their employees to thrive and thereby enhance safety performance.

Chapter 7

General Discussion and Conclusion

Emotional intelligence (EI) offers an important perspective in explaining the difference in individuals' work outcomes (Carmeli, 2003; Kukah et al., 2021; Meisler & Vigoda-Gadot, 2014). Over the past few decades, a considerable number of studies have examined how EI affects individuals' in-role and extra-role performance (Carmeli et al., 2006; Jr et al., 2011). It is also critical for organisations to understand and leverage EI to enhance their employees' safety-related behaviours as it significantly impacts their sustainable performance. As mentioned earlier, the literature review suggests that EI's influence on employee work outcomes, particularly on safety performance and the related underlying mechanisms, need to be further explored by considering both individual and organisational circumstances (Ifelebuegu et al., 2019; Wang et al., 2021). Further, the past findings concerning the predictive validity of EI on individuals' performance showed inconsistent results (Janovics & Christiansen, 2001; Newsome et al., 2000). Therefore, this thesis intends to contribute to the existing EI–performance literature by offering empirical evidence regarding EI's influence on safety performance.

The literature review of the past studies on EI and performance led me to conclude that EI's prediction on performance is more indirect than direct. Therefore, in the current research, I introduced two mediating paths into the relationship between EI and safety performance to identify the underlying mechanisms (i.e., situational awareness and thriving). Furthermore, I proposed to examine the potential impacts of two boundary conditions (i.e., training inadequacy and career adaptability) on the above relationships.

Overall, this thesis provides important insights to enhance the currently insufficient research on the EI-safety performance link, through establishing two nuanced moderated mediation models that help identify novel mediating factors as well as boundary conditions from both individual and organisational perspectives. The findings have generated useful practical suggestions for safety management. In the following sections, I will first present an

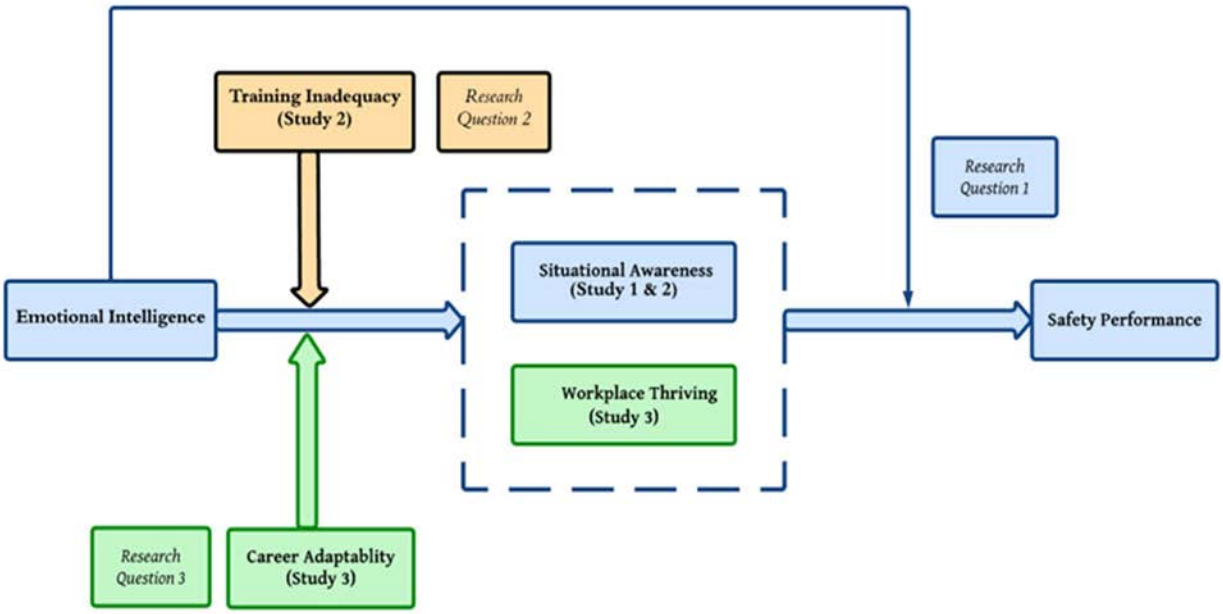
overview of the three empirical studies via a summary of key results, followed by the elaboration on research limitations and the discussion around the directions for further research.

Overview of Studies

As shown in Figure 7.1, this thesis addresses three main research questions. Research Question 1 looks at how EI affects pilots' safety performance through situational awareness, and explores whether EI can alter the strength of the relationship between situational awareness and safety performance. Research Question 2 examines how company safety training influences the relationship between EI and safety performance and the associated mechanism. Meanwhile, I tested the moderating effect of training inadequacy on the relationship between EI and safety performance, and on the mediating relationship between EI and safety performance via situational awareness. Research Question 3 addresses how EI affects safety performance through thriving at work, and how pilots' career adaptability influences the relationship between EI and safety performance and the associated mediation mechanism.

Figure 7.1

Overview of the Empirical Studies



Summary of Results

In this section, I summarise the main results from the three empirical studies presented in Chapters 3, 4, and 5. Collectively, these studies provide a comprehensive understanding of the intricate relationships between Emotional Intelligence (EI), safety performance, and the various mediating and moderating factors that influence these dynamics. Each study builds on the insights of the previous one, providing a progressively deeper perspective on how EI impacts safety-related behaviours in high-risk environments such as aviation.

Study 1 Results

In Study 1 (Chapter 4), based on Griffin and Neal (2000) safety performance framework, I examined the relationship between EI and two aspects of safety performance (i.e., safety compliance and safety participation) separately. Regression analysis was used to test the mediating effect of situational awareness on these relationships. I applied Hayes' (2013) PROCESS macro to explore the moderating role of EI on the relationship between situational awareness and safety performance, and on the above mediating path.

The results show that EI was positively and significantly related to safety performance on safety compliance and safety participation. This finding offers evidence that the positive effect of EI on work performance could be popularised in some specific work contexts (e.g., safety contexts). Furthermore, situational awareness was found to mediate the relationships between EI and two aspects of safety performance. The disclosure of this underlying mechanism explains how EI affects the proximal factor of safety performance (e.g., situational awareness) which, in turn, improves safety behaviours. The results further suggest that EI moderated the relationship between situational awareness and safety performance. Specifically, the positive relationship between situational awareness and safety performance was higher when EI was lower. Lastly, this study shows that EI can alter the mediation effect of situational awareness, which aligns with the proposition that EI can compensate for the absence/insufficient of other cognitive intelligence (e.g., situational awareness). That is, individuals with a high-level information processing skill set and knowledge are less likely to rely on EI to achieve higher performance. These findings provide an indicative explanation of why previous studies have inconsistent results concerning the impact of EI on individuals' performance (Bozionelos & Singh, 2017; Kopp & Jekauc, 2018). Compared with low EI possessors, under certain work contexts, high emotionally-intelligent individuals may have more robust capability or attributes facilitated by EI (e.g., psychosocial, psycho-environmental, or socio-cognitive) to deal with emerging situations; therefore, will perform tasks better (Gong et al., 2019; Saklofske et al., 2012; Schneider et al., 2013). In this case, individuals with higher-level EI have advanced information processing skills to prompt safety performance rather than relying on situational awareness to stimulate performance. In general, these results suggest that EI has an important effect on employees' safety-related behaviours, and that its influence relies on the mediating role of situational awareness.

These findings from Study 1 established a foundational understanding of the direct relationship between EI and two key aspects of safety performance: safety compliance and safety participation. The study demonstrated that situational awareness mediates the relationship between EI and safety performance, indicating that EI enhances safety behaviours by improving an individual's situational awareness. Additionally, the study revealed that EI moderates the relationship between situational awareness and safety performance, with a stronger positive effect observed when EI is lower. This suggests that individuals with lower EI rely more on situational awareness to achieve high safety performance, whereas those with higher EI may utilize their emotional processing capabilities to compensate for lower situational awareness.

Study 2 Results

In Study 2 (Chapter 5), I extended Study 1 to explore the relationship between EI and safety performance via situational awareness by introducing an organisation-level contextual factor. The results of Study 1 have confirmed the mediation path of situational awareness on the EI-safety performance relationship. In Study 2, I addressed the question concerning when EI can affect, or more strongly affect, individuals' safety-related behaviours. First, I re-tested the prior mediation path by using a sample of full-time commercial pilots in airline companies which was different to the sample used in Study 1. Study 2 further confirmed Study 1 results about the mediation of situational awareness and thus enhanced the robustness of the prediction that EI plays its role on performance through its effect on the proximal factors of performance. Second, based on the Trait-Activation Theory (TAT) (Tett & Burnett, 2003), I introduced company safety training inadequacy as an adverse condition to examine its moderating effect on the afore-mentioned mediation relationship. The results show that EI was triggered by a lack of training to enhance its influence on situational awareness, and

training inadequacy strengthened the influence of EI on safety performance via situational awareness.

Following the well-established process, I used the three-step hierarchical regression analysis to test the impact of training inadequacy on the relationship between EI and situational awareness. The results showed that training inadequacy could strengthen the afore-mentioned relationship. Specifically, when the organisation cannot provide sufficient safety training to their employees, high EI individuals tend to show more vigilance and become more cautious about the situation changes when performing safety-related tasks. This finding is in line with the proposition of TAT (Tett & Burnett, 2003). According to TAT, under certain exterior circumstances, personal attributes can be triggered to exert greater influences on one's cognitions, psychological states, and behaviours (Judge & Zapata, 2015). In this case, individuals' EI was activated to greater effect which, in turn, enabled them to challenge the adverse effect caused by insufficient safety training and retain suitable situational levels in safety contexts. Furthermore, my test on the moderated mediation relationship between EI and safety performance shows that the mediating function of situational awareness receded when safety training was more sufficient. This finding provides empirical evidence for the argument that EI's influence on individuals' attitudes and behaviours may be more indirect than direct, and subject to certain work environment contexts as well (Rode et al., 2007).

All these results offer extra solid explanations on how and when EI can impact employees' safety performance. Meanwhile, the activation mechanism on EI's effect stimulated by insufficient training extends Study 1 by showing that individuals tend to maximise their inherent personal resources (e.g., emotional intelligence) to conquer challenges when perceiving a lack of supporting sources from organisations.

Building on the insights from Study 1, Study 2 extended the analysis by introducing organizational context as a critical factor influencing the EI-safety performance relationship. Specifically, the study explored how the adequacy of safety training within an organization moderates the mediation effect of situational awareness. The findings confirmed that when safety training is insufficient, EI is activated more strongly, enhancing its influence on situational awareness and, subsequently, safety performance. This study highlighted the importance of contextual factors in determining when and how EI impacts safety behaviours, suggesting that individuals with higher EI are more capable of compensating for organizational deficiencies, such as inadequate training, by leveraging their emotional intelligence to maintain situational awareness and safety performance.

Study 3 Results

Study 3 (Chapter 6) used the same data as Study 2 to explore the moderating effects of career adaptability on the relationship between EI and safety performance through the mediator of thriving. Similar statistical methods as used in Study 2, hierarchical regression analysis and PROCESS macro (Hayes, 2013), were applied to examine the moderating effects and mediating mechanism.

The results show that thriving at work can mediate the positive relationship between EI and safety performance. Specifically, EI facilitates individuals in maintaining a sense of vitality and learning needed for workplace thriving and, in turn, the thriving individuals are inclined to perform beyond expectations. These findings are consistent with the Socially Embedded Model of Thriving (SEMT) (Schutte & Loi, 2014), which emphasises that personal resources (e.g., EI) can promote thriving and growth at work. This mediation path of workplace thriving reconfirmed that EI needs a medium to transmit its effect on work performance.

In addition, it was found that the personal factor of career adaptability strengthens the positive influence of EI on individuals' thriving and enhances the indirect effect of EI on safety performance through thriving. This means that career adaptability can stimulate the effect of EI in enabling thriving and then in improving safety performance. In detail, the relationship between EI and thriving was stronger among employees who possess high-level career adaptability, as was the indirect relationship between EI and safety performance via thriving. These findings are according with Career Construction Theory (CCT) (Savickas, 1997, 2002, 2013) that emphasises individuals comprehend the positive meaning of tasks and continuously adapt themselves to fit the work environment to achieve favourable work outcomes (e.g., performance) (Ohme & Zacher, 2015; Zhu et al., 2019). The results provide valuable insights on the process through which EI can facilitate an individual's safety performance by identification of thriving as a new mechanism. Meanwhile, this exploratory study further confirms that, in general, the role of EI on safety performance occurs more indirectly than directly (Rode et al., 2007).

Study 3 introduced a personal factor, career adaptability, as a moderator in the relationship between EI and safety performance through the mediator of thriving. The study showed that thriving at work mediates the positive relationship between EI and safety performance, with career adaptability further enhancing this effect. This suggests that individuals with high career adaptability are better able to utilize their EI to foster a sense of thriving, which in turn leads to improved safety performance. The findings from this study reinforce the idea that the influence of EI on safety outcomes is often indirect, mediated by other psychological and contextual factors.

Together, these three studies provide insights that facilitate deeper understanding of when and how EI can impact safety-related behaviours. From Study 1 to Study 3, the findings reveal the value of focusing on the underpinning mechanism of the link between EI and

safety performance, and the influence of factors from an individual level and an organisational perspective.

Summary Across the Three Studies

Across all three studies, EI consistently plays as a critical role in enhancing safety-related behaviours, either directly or through its interaction with situational awareness, organizational context, or personal adaptability.

The research reveals that the relationship between EI and safety performance is not straightforward but is instead shaped by a complex interplay of mediating and moderating factors. Situational awareness, as shown in Study 1 and Study 2, serves as a crucial mechanism through which EI influences safety behaviours, while organizational factors like safety training inadequacy can diminish this effect. Meanwhile, personal characteristics such as career adaptability, as demonstrated in Study 3, further enhance the impact of EI by fostering a work environment where employees can thrive.

Together, these studies underscore the importance of considering both individual and organizational factors when assessing the role of EI in safety performance. They also highlight the value of adopting a multi-level perspective that consider how personal resources (like EI and career adaptability) interact with situational and organizational contexts to influence safety outcomes.

Theoretical Implications

This thesis has identified the important role of EI on individuals' safety performance by employing two distinct sets of samples collected from the safety-centred industry. Drawing on the EI-work performance link (Sadovyy et al., 2021) and safety performance model (Griffin & Neal, 2000), this thesis has set up a complex research framework (shown in Figure 7.1) to examine EI's effect on safety performance. The findings provide us with a new angle to view the understanding of the relationship between EI and safety performance.

Additionally, integrating individual and organisational factors in the research framework will enlighten future research directions on the study of EI-work performance. Since the key findings have been elaborated in the earlier chapters, I will succinctly outline the main theoretical implications of this thesis here.

Based on the theory that EI has a positive influence on work performance (Jr et al., 2011; Law et al., 2008; Mayer et al., 2008a), this research extended our knowledge of EI's predictive effect on safety performance by integrating multiple theoretical perspectives. As discussed in Chapter 2, EI as a critical predictor of individuals' work performance has not been widely studied within safety-critical occupations, in which individuals are required to have a higher level of situational consciousness and skills to carry out tasks safely.

Overall, the results of the three studies confirmed the significant impact of EI on safety performance. The findings in Chapter 4 (Study1) provide a more comprehensive understanding that EI can facilitate individuals' information processing capability (e.g., situational awareness) to improve safety behaviours at the workplace. This reflects the core value of EI's competencies in using perceived information to guide one's thinking and actions (Salovey & Mayer, 1990). As suggested in this study, EI can cultivate individuals with the ability of being sensitive/vigilant about the subtle emerging information around the workplace, discern the implication of the information clues, and forecast the coming changes, which grants individuals sufficient preparation to challenge the changing situations. With the consideration of emotional management, individuals with high EI may interpret the information clues more thoroughly by avoiding the effect of negative emotions (Hoerger et al., 2012). The results of Chapter 5 (Study 2) present that EI as a critical determinant of performance, can be activated to expand its prediction on individual information processing skills and promote safety-related behaviours. In addition, these findings extend TAT from stable personal traits to incorporate emotional ability, which, like personality, may also be

activated by relevant situations. Although debates continue regarding whether EI should be categorised as a personal trait or independent ability, this study treated EI as a cognitive emotion information processing ability and used a self-report ability measure. Future research may draw upon TAT to consider applying other external constraint factors (e.g., incivility, stressors, and job demands) to examine whether EI's function can be activated to exert greater effect.

This thesis also explored multiple moderated mediation mechanisms to provide empirical evidence for the perspective that EI's influence on work performance is more indirect and constrained to some contextual conditions. Chapter 4 demonstrated the moderating impact of EI on the relation between situational awareness and safety performance, which denotes that EI can serve as a complementary intelligence to increase the function of cognitive ability (Cote & Miners, 2006). The results have proved that EI meets the characteristics of a distinct intelligence and should be treated as cognitive information-processing intelligence (Fiori & Vesely-Maillefer, 2018; MacCann et al., 2020; Puffer et al., 2021). Chapter 5 presents that EI can be activated to enhance its influence on situational awareness when contextual factors (e.g., training inadequacy) impedes an individual's performance. That is, when high EI individuals feel the safety-originated training provided by the company is insufficient, they are most likely to rely on their internal attributes (e.g., EI) to perform their duties confidently.

Extending the two afore-mentioned studies, Chapter 6 examined the mediation function of thriving underlying the relationship between EI and safety performance. The results show that EI can promote an individual to thrive by motivating him/her to learn new things while retaining a sustainable vitality status. High EI individuals process sophisticated emotional management skills in handling extreme negative affects (e.g., anxiety, depression, and fear) of their own and others, and remain in calm states to reason and behave. This is

consistent with thriving research that people in stable, well-managed emotion states, tend to thrive and perform better than their counterparts who are easily affected by dramatic emotions (Puffer et al., 2021). All in all, EI can improve safety performance by not only transmitting its influence on the proximal cognitive factors (e.g., situational awareness), but also by interacting with other personal attributes consisting of both cognition and affect aspects (e.g., thriving) to achieve the same results.

Meanwhile, the introduction of a boundary condition, career adaptability, shows that this self-adaptation capacity strengthened EI's function in enabling thriving which, in turn, promotes safety performance. This contributes to workplace thriving literature and CCT in several ways. First, the findings show that EI is an important personal predictor of thriving at work, which extends previous research on affect-related antecedents of thriving. For example, Kleine et al. (2019) proported that positive affect and negative affect are two separate individual characteristic antecedents of thriving as these two factors have opposite impacts on thriving. Second, this study presents that the individual who is concerned about one's own career development tends to utilise his/her personal resources such as EI competencies to thrive at work. As a consequence, thriving, serving as an internal momentum for self-development, leads to favourable outcomes such as safety performance.

Third, extending previous research on EI-work performance (Gong et al., 2019; Kotsou et al., 2019; Zhu et al., 2022), these findings generated from multiple samples provide a more comprehensive conclusion that EI's influence on performance is not limited to situations where the use of emotional labour is extensive (e.g., customer services, sales, and teaching), but can be applied to broader contexts. Although some studies show that the influence of EI on individuals' work performance is weak or insignificant, I contend that certain personality traits and situational factors need to be considered to reach a more informed and contextualised conclusion about the proposed relationships. In fact, the

workplace is characterised as a context that can make people emotional, in that the interwinding of interpersonal and intrapersonal activities at work can cause the occurrence of emotional distractions and reactions (Drigas & Papoutsi, 2019; Khalili, 2012). The findings of the studies presented in this thesis may be more convincing if the results can be validated by a greater sample size or examined in other cultural settings. Together, these three studies provide a more complicated lens to understand how and when EI affects safety performance. The following sections provide a more detailed explanation of the relationships proposed in the research model.

EI-Safety Performance

The EI-safety performance model is the cornerstone of the research framework in this thesis. I adopted Griffin and Neal (2000) safety performance conceptualisation which was developed from work performance theory to measure individuals' safety behaviours. As noted earlier, safety compliance and safety participation are the two main dimensions of safety performance. The former is defined as the core safety activities based on the definition of task performance; the latter refers to the safety-related helping behaviours that support workplace safety based on the definition of contextual performance. Accordingly, three determinants of safety performance, knowledge, skill, and motivation, were identified primarily according to Campbell et al. (1993) performance theory. Griffin and Neal (2000) argued that the antecedents lead to a variability of safety performance among individuals through their effects on knowledge, skill, and motivation. All three of the research questions were designed to explore the relationships between EI and the antecedents of safety performance from an individual perspective and an organisational level.

The current thesis, with two distinct samples, support that claim that EI has a strong positive association with safety performance. As presented in Chapter 4, the relationships between EI and safety compliance and safety participation were both significant; there is no

significant variation between the coefficients of the effects of EI on safety compliance (β = 0.43) and on safety participation (β = 0.41). I also acknowledge that emotional competencies motivate individuals to devote extra efforts beyond their responsibilities to engage in voluntarily helping others and supporting workplace safety.

Then, my attention shifted to examining how EI can influence the proximal antecedent of safety performance. In Studies 1 and 2, I introduced situational awareness (safety-oriented cognition knowledge) as the mediator of the relationship between EI and safety performance. In aviation, situational awareness is a crucial determining factor of safety performance (Endsley, 2000). While a considerable number of studies in safety-critical industries (e.g., aviation, emergency management, and oil and gas operations) (Endsley, 1995c) prove that situational awareness aids in the decision-making process and drives individuals to take proactive actions to improve safety performance, there is a lack of research on how situational awareness can be impacted by personal attributes such as EI in safety-related contexts. The results, as expected, show that EI has a substantial positive association with situational awareness, and this influence can be extended to affect safety performance. Since I examined EI's impact on two separate aspects of safety performance in the first study and confirmed the positive relations, I treated safety performance as a whole concept in Studies 2 and 3. This consideration is based on the view that both safety compliance and safety participation are more or less proactive behaviours (Curcuruto et al., 2019); EI enhances individuals' conscientiousness and affective commitments to their daily work (Barreiro & Treglown, 2020). Therefore, it is reasonable to focus on a broader safety behaviour construct rather than differentiating two safety dimensions when seeking to understand individuals' safety work behaviour.

Training Inadequacy as a Boundary Condition

Safety-related training equips individuals with the requisite safety knowledge and skills to carry out their daily work to meet the required safety standards. Hu et al. (2016) suggested that these two determinants predicted individuals' motivation to obey safety policy and procedure and engage in helping behaviours. Many studies proved that training is an effective way to improve employees' performance (Guan & Frenkel, 2018). A lack of training can cause serious negative impacts on employees' safety behaviours in the workplace, and can lead to negative psychological emotions (e.g., anxiety, depression, and stress), which will lower their confidence and jeopardise their performance. Further, training inadequacy may create a passive safety climate and deliver the impression that safety is not supported by the company, and this can cause employees to detach from safety rules and lower intent to maintain safety standards. In addition, perceiving insufficient training makes employees feel that they are not valued by the management, which, in turn, drives them to seek other opportunities and increase turnover intention. According to TAT, such environmental factors can trigger individuals' relatively stable traits or ability to conquer the challenge caused by adverse situations (Judge & Zapata, 2015).

In Study 2, training inadequacy, introduced as an adverse situational context, was examined as a boundary condition on the relationship between EI and safety performance through situational awareness. The results show that EI's effect on this mediation relation was enhanced by training inadequacy, which meets our expectation that EI can be activated when experiencing training inadequacy. In other words, under certain external adverse situations, individuals with higher-level EI deliver better performances compared to their counterparts. This is probably because EI could facilitate individuals' resilience and enable them to maximise their own potentiality to gain greater achievement when facing difficult situations (Di Fabio & Saklofske, 2018; Trigueros et al., 2020). This study adds to the line of

research that explores whether the principles underlying TAT can also apply to ability in addition to personal traits, as originally emphasised in TAT. The findings show that some personal abilities (e.g., EI) can be triggered by contextual conditions and therefore improve particular psychosocial competencies or skills (e.g., situational awareness). In this case, my results present a new angle of understanding regarding the premise influence factor of EI from the organisational level by focusing on training inadequacy, which is a common phenomenon, especially for new established small companies who lacking capabilities or sources to provide sufficient training for their employees. This pioneer study suggests that the importance of exploring other latent personal traits or abilities that might be activated by contextual factors could expand the influence on work performance. Meanwhile, this study also raises the interesting proposal that future research should consider further examination of other potential situational factors that may trigger EI to play a greater positive influence on situational awareness and other proximal antecedents of safety performance.

As highlighted earlier, Study 2 also confirmed the results of Study 1 regarding the meditation path of EI impact safety performance through situational awareness, a proximal indicator of safety performance. Recently, scholars proposed that safety performance should include proactive behaviours such as safety initiatives. Proactive behaviours refer to an individual who proactively takes responsibility for suggestions and promoting changes that will improve safety (Curcuruto et al., 2019, p. 3). By nature of preparation for future changes, situational awareness provokes an individual to take proactive actions to handle the coming challenges at work. This new emerging research streamline also supports our theory model that EI can impact the proactive predictor (e.g., situational awareness) and therefore improve safety performance. It may be worthy to explore the relations between EI and proactive behaviours, and the combined influence on safety performance.

The Roles of Thriving and Career Adaptability

Up to now, I have elaborated on the first two research questions of the thesis that EI has a positive influence on individuals' safety performance, and that the influence can be strengthened under the condition of certain contextual factors (e.g., training inadequacy). Next, in Study 3, I extend my exploration of the relationship between EI and safety performance by introducing a new mediating mechanism - workplace thriving. I employed the same survey data as in Study 2 in which participants are full-time pilots who work for airline companies. The aim of Study 3 first focused on the prediction of EI on workplace thriving, and then tested the mediation role of thriving on the relationship between EI and safety performance. I further examined career adaptability as a boundary condition moderating the proposed mediation relationship. As expected, the findings show that EI has a positive association with thriving, and thriving in turn promotes individuals' superior safety performance. Compared with the mediating effect of situational awareness on one's cognitive information process, thriving facilitates safety performance on both cognitive (learning) and affective (vitality) aspects. This study advances the literature by providing preliminary evidence that EI can foster one's thriving experience, which is a relatively new finding, while simultaneously focusing on the mediation role of thriving in this study that fills the gap in previous safety research.

First, regarding the mediating role of thriving in the EI and safety performance relationship, there are some potential explanations. EI can potentially promote the key components underlying a sense of thriving. For example, EI competencies assist to manage one's internal responses, moods, and state of mind, in a way that helps the individual retain a stable, calm state and suppress negative effects (e.g., nervous, anxiety, and depression) so as to remain mentally energetic (Moroń & Biolik-Moroń, 2021). Meanwhile, emotionally intelligent individuals presented a higher tendency to seize all potential learning opportunities

to improve themselves (Kleine et al., 2019). The verification of the relationship between EI and thriving is consistent with the SEMT, which emphasises that affective resources (e.g. EI) is a proximal indicator of thriving. As mentioned before, individuals with high EI have clear self-awareness of their strengths, limitations, and have the confidence in pursuing improvement through acquiring new knowledge and skills (Watkins et al., 2017). On the other hand, the association between thriving and safety performance is consistent with the thriving model of human growth which emphasises that thriving can promote one's work performance (Spreitzer & Porath, 2014). The findings illustrate that a thriving employee tends to carry out safety-related duties in a thoughtful way because s/he views the completion of such tasks as the progress of capability development. Meanwhile, a thriving person is most likely to participate in voluntary activities (e.g., attending safety seminars) because they consider the involvement in such activities as an effective way of sharing and collecting knowledge and skills with other colleagues.

Second, the findings show that the facilitating role of EI in shaping a sense of thriving could be strengthened by one's career adaptability. That is, with higher career adaptability, high-EI employees were most likely to experience thriving which, in turn, drives them to achieve superior safety performances. These findings advance the SEMT (Spreitzer et al., 2005) by supporting that personal resources (e.g., EI and career adaptability) can interact with each other to enable employees to experience thriving. That is, career adaptability serves as a ready-prepared state for future career transition, motivates an individual to learn intentionally, and mobilises their application at work. Driven by career adaptability, an individual is most inclined to leverage their own personal resources (e.g., EI) to behave agentically to seek further growth. The confidence developed through these agentic behaviours may help solve emerging work-related problems, contributing to their feeling of

vitality (Kleine et al., 2019). Consequently, the interaction between EI and career adaptability can boost greater thriving.

Third, the findings reveal that career adaptability moderates the mediating relationship between EI and safety performance through thriving. This refined moderated mediation framework provides a new view, in addition to the perspective highlighted in Study 2 about how EI impacts safety performance; specifically, in individuals with higher levels of career adaptability. In general, career adaptability indicates one's ability to adapt to transformation along with his/her career development, and concentrates on the readiness of psychological resources to match the current and anticipated changes in the future (Haibo et al., 2018; Kundi et al., 2021). Individuals with higher career adaptability are self-driven to develop competencies by learning work-related knowledge and skills, and are able to use their personal attributes and abilities like EI to maintain their thriving status in the workplace (Kleine et al., 2019; Nawaz et al., 2020). The findings suggest that the characteristics of career adaptability (e.g., self-confidence, self-adaptation, and control) enable thriving to enhance its mediating effect on EI-safety performance. Also, the study's results contribute to the safety performance literature by integrating CCT (Savickas, 1997, 2002, 2013) with the SEMT to establishing a complex moderated mediation model.

Practical Implications

Overall, this thesis presents a complex mechanism of the EI-safety performance relationship in the Chinese aviation context and revealed the potential roles of individual and organisational factors in the EI-safety relationships examined. In Chapters 4, 5, and 6, I discussed potential practical implications for organisational practitioners for each study. Reflecting on these practical implications, this section provides a more integrative elaboration on how this thesis can make contributions to managerial practice overall.

As stated earlier, the findings of this thesis underscore the significance of EI, situational awareness, and thriving as important predictors of individuals 'safety performance within Chinese organisational settings. The results revealed that EI has a positive influence on safety performance, but also facilitate the development of situational awareness and thriving. EI can cultivate a heightened sense of situational awareness and retain a state of thriving in the workplace. High EI individuals demonstrate the quality to interpret and effectively respond to the emerging changes in the environment. This enhanced information processing capability leads to an elevated state of situational awareness. Meanwhile, the results indicate that individuals with a high level of EI tend to be learning-originated and show higher enthusiasm in what are they doing. This self-motivated learning intention prompts their thriving in the workplace. Furthermore, the research results revealed indicate that training inadequacy, a common concern for newly-established companies, can compromise employees' safety performance. Given this challenging scenario, individuals' EI was triggered to exert a greater impact on cognition activity, such as advanced situational awareness. This emphasises the importance of organisations providing compressive safety training programs to cultivate a safety culture, where employees can be adequately trained to manage safety issues and mitigate potential risks.

Lastly, this thesis identifies that career adaptability could strengthen EI's effect on thriving, subsequently prompting safety performance. These findings recognise that individuals with higher career adaptation capability leverage their EI to prompt personal flourishing and growth, but also enhance the mediation process between EI and safety performance through thriving. These results provide human resource and line managers with feasible solutions on how to promote employees' safety compliance and participation behaviours.

First, the findings of the thesis proposes emotional intelligence as a helpful selection criterion for organisations and managers when recruiting new employees for safety-critical positions or assigning safety-related responsibilities to employees. Considering the significant impact of EI on employees' safety performance, human resources managers are encouraged to apply EI assessments in the recruitment and selection process for safety-critical contexts. For example, according to the requirements of the roles, professional experts in EI can design appropriate assessment methods (e.g., surveys, test banks, observations, and interviews), and predetermine thresholds for the results to exclude candidates who fail to meet the specified standards. In addition, it is also practical to assess team members' EI initially and then select the ideal candidates based on the evolution results when managers need to assign safety-related responsibilities. While organisations commonly prioritise offering training in work-related technique skills, the development of personal psychosocial ability, such as like EI, is sometimes overlooked. Past research highlights that EI can be enhanced via targeted training (Campo et al., 2019; Gilar-Corbi et al., 2019). Organisations and human resources practitioners may consider implementing well-designed EI training programs for their existing employees as a potential strategy to promote overall safety performance.

Second, this thesis indicates the importance of heightened situational awareness in bolstering employees' capabilities in executing safety tasks, informing human resources managers of an additional strategy to enhance workplace safety behaviours. As demonstrated in Chapter 4, individuals with a lower level of EI exhibited a heightened reliance on situational awareness when engaging safety-related tasks. This insight implies that supervisors and managers need to pay close attention to monitor and cultivate employee's situational awareness, recognising the direct impact on safety performance. A practical approach is recommended, proposing the potential benefits of pairing employees who possess high-level situational awareness with those possessing low-level situational awareness in a

team rather than grouping people with the same level together. This deliberate combination method can utilise strengthens to potentially achieve more desirable results (Endsley, 2021). In addition, organisations may consider the implementation of situational awareness training courses to improve employees' information processing skills within a controlled and supportive environment (Endsley, 2015c; Wickens & Carswell, 2021). By investing in such training, organisations can enhance their employees' ability to manage more complex safety-critical scenarios, but also contribute to establishing a sustainable safety culture.

Third, this thesis advocates that organisations endeavour to provide sufficient, comprehensive, and quality safety training to employees, with a particular emphasis on industries where safety is non-negotiable and integral to daily activities. Extensive research has consistently proved that training is an effective approach to fostering employees' capabilities of performing tasks, but also impacts employees' willingness to engage in safety-related voluntary activities, such as attending safety meetings and assisting colleagues (Bayram et al., 2021; Shepherd et al., 2021). While the advantages of training are widely recognised, it is crucial to acknowledge that many new and small-size organisations face the common challenge of providing compressive training programs (Abu et al., 2019; Wong & Aspinwall, 2004). In the case of this thesis, it became apparent that insufficient training may place a heavier reliance on employees' EI to retain an acceptable level of situational awareness needed in the context of safety. This is consistent with TAT that, under the adverse circumstances of a lack of sufficient safety training, individuals' emotional competences are more likely to be activated to play a greater role (Tett et al., 2021). On this basis, managers may consider the possibility of involving psychologists in assessing employees' EI levels. This information can be used to determine the list of staff members who might be prioritised for safety-related training, particularly those with lower EI levels.

Fourth, in addition to the aforementioned perspectives, this thesis provides organisations and practitioners with additional and contemporary insights into how to improve employees' behaviours safety performance. From the human resources management perspective, it is ideal for organisations to create a positive work environment (e.g., high-level of autonomy, an open information-sharing atmosphere, and heightened civility to enable employees to thrive (Kleine et al., 2019; Walumbwa et al., 2018; Zhu et al., 2019)]). Thriving employees, in turn, reciprocate organisations with higher performance and innovative solutions regarding current procedures and processes. However, there is always the case that organisations lack the resources or cannot eliminate all factors hindering thriving. Especially during major organisational changes, human resources managers are advised to consider implementing strategies that are targeted to improve employees' EI and career adaptability. As discussed earlier, career adaptability positively influences EI in enabling individuals' experience of thriving and thus enhancing safety performance. To utilise this approach, managers may consider incorporating the enhancement of career adaptability — focusing on aspects like enhancing employees' sense of concern, control, curiosity, and confidence in their careers — into the company training curricula. This practical integration can drive employees' safety performance towards an advanced level, aligning organisations' objectives with individuals' career development and overall well-being.

In conclusion, this thesis provides potential guidance for organisations in the preparation of company training schemes. Employees can be carefully selected, trained, and supported through a positive work safety environment to drive situational awareness (safety knowledge) and thriving (safety motivation), which in turn leads to higher safety performance. As previously emphasised, safety-related training can improve employees' safety knowledge and skills that directly impact safety compliance and participation behaviours. It is critical that the organisation's training developers and implementers ensure

that all essential safety content is included in the training courses. It is noteworthy that not all safety-critical industries may have implemented situational awareness training for their employees. Given the significant influence of EI on safety performance, it is wise to invest in the enhancement training of employees' emotional competencies. It should certainly be considered in the budget, as it will definitely benefit the organisation to include career adaptability in their training program.

Limitations and Future Research Directions

Sample Characteristics

The participants were pilot trainees and full-time pilots servicing the commercial aviation industry. While he samples provide valuable insights into the relationship between Emotional Intelligence (EI) and safety performance, certain typical characteristics might warrant further attention to enhance the generalizability and applicability of the findings in future studies.

First, in the sample for Study 1, 95.7% of participants were male trainees, and in the sample for Studies 2 and 3, 97.7% were male pilots; there was a gender bias. This gender imbalance suggests that the results may primarily reflect the experiences and behaviours of male pilots, potentially limiting the applicability of the findings to female pilots or those in other gender-diverse populations. This bias is particularly important when considering other male-dominated industries such as mining, mechanical repairs, nuclear plants, and transportation, where similar safety performance dynamics may exist. Future research should consider incorporating a more balanced gender representation or using qualitative approaches to explore how EI and safety performance interrelate among female pilots. Such studies could provide deeper insights into gender-specific factors that influence safety outcomes and help expand the applicability of the findings to a broader demographic.

Second, the sample size in this research was relatively small. The inclusion criteria were restricted to pilots working in or preparing to work for commercial airline companies, excluding a large portion of pilots employed in the general aviation industry. General aviation operates under distinct civil regulation frameworks with slightly different safety requirements compared to commercial aviation. As a result, the findings may not fully capture the difference of safety performance across different aviation contexts. Future research may consider expanding the data collection to encompass both commercial and general aviation contexts. By examining the relationship between EI and safety performance across diverse aviation environments, researchers can better understand how regulatory differences and operational contexts influence these dynamics. This broader approach would allow for a more comprehensive examination of latent variations in the EI-safety performance relationship, thereby enhancing the generalizability of the findings.

Lastly, the potential biases introduced by the sample characteristics, such as the overrepresentation of male pilots and the exclusion of general aviation professionals, highlight the need for careful interpretation of the results. These limitations suggest that while the findings provide valuable contributions to the understanding of EI and safety performance, they should be viewed as a starting point for further research that incorporates a more diverse and representative sample. Addressing these limitations in future studies will help build a more complete and profound understanding of the factors that influence safety performance in the aviation industry and beyond.

Data Collection

In this thesis, both online and paper surveys were used to collect the data from several cities in mainland China and the response rate showed an insignificant difference between these two methods. The research sample involved two distinct occupation groups for the three studies: in Study1, the participants were trainees in flight training schools; in Studies 2 and 3,

the participants were full-time pilots in commercial airline companies. It is worth noting that the response rate for the first-time wave for the first study was relatively low. This could be attributed to the fact that the trainees who were eligible to participate in the survey were in the middle of the transition to other training bases for their subsequent training stage at that time which might have influenced the response rate. Future researchers should give careful consideration to the working scheduling of participants from highly mobile population groups, such as pilots and fly-in-fly-out workers.

A total of two sets of single-source data were collected for this thesis. However, the mediators and dependent variables were collected at the same time point, which may have introduced common method bias. In Study 1, the measures for situational awareness and safety performance were collected at the second wave. For Study 2, employee thriving and safety performance were collected one month after the first wave. Although CFA indicates that the biases were not statistically significant, it remains challenging to eliminate the effects of their effects completely. Future researchers should take appropriate strategies to reduce common method variance. For example, they may consider separating the independent variables, mediation variables, and dependent variables into three distinct surveys, and collecting the data at three separate time points.

Measurement Concerns

There is a primary concern in measuring instrument selection. That is, safety performance was measured using self-reported scales. Ideally, such assessments should be reported by supervisors or by peers to reduce the potential bias effect stemming from respondents' social desirability. Even using supervisors' appraisal cannot entirely eliminate the social desirability bias as their review is subject to organisational values (Conway & Lance, 2010). Recently, scholars argued that the self-report approach is not inferior to other-reports approaches (Conway & Lance, 2010) and has been widely used in safety-related

research (Christian et al., 2009; Griffin & Hu, 2013). Although the self-report approach in some cases is not inherently flawed, future research should endeavour to employ other-rated or/and objective data for behaviour- or performance-related variables. For example, when practical, utilising employees' archived safety records/files and combining it with peer and supervisory evaluation of safety performance could be an ideal option. Additionally, applying an experimental study, such as laboratory or scenario-based designs, to collect observation data on safety performance or behaviours would offer another optimal solution.

Second, the selection of a situational awareness instrument was also a significant challenge due to the limited availability of valid self-report measurements at the commencement of my PhD study. One prevalent situational awareness measurement involves the use of specialised equipment to track the movement of participants' eyeballs to determining their capability to perceive changes and redirect attention to the correct information. An alternative objective approach requires testers to engage in simulated scenarios, with experts observing their responses to assess alignment with the correct actions. In this thesis, the self-report approach was chosen to gather insights into participants subjective experience and perceptions due to its practicality and relevance to the study's objectives.

Choices of Mediators and Moderators

Based on safety performance theory, the influence of potential personal and situational factors on safety performance manifest through their impacts on three proximal determinants: motivation, knowledge, and skills (Christian et al., 2009). This thesis, however, focused specifically on investigating two pathways — situational awareness and thriving — as mediators in the relationship between EI and safety performance. Situational awareness, a critical element in safety domains such as aviation, medicine, transportation, and nuclear industries, contributes to the development of associated knowledge and skills that enhance

individuals' safety behaviours. Further, I examined training inadequacy as a boundary condition in the above relations which revealed that, under adverse situations, EI was triggered to play a greater role in both influencing situational awareness and safety performance. Despite the recognised importance of situational awareness, it is worth noting that higher-level situational awareness may not always guarantee improved safety performance, as its impact can be subject to some contextual conditions (Stanton et al., 2001). Future research may consider exploring other organisational-level factors, such as safety climate, leadership style, and workload, to examine their interactions with situational awareness and understand how these interactions transit the impact on safety performance.

I then examined the mediating function of thriving on the relationship between EI and safety performance under the boundary condition of career adaptability. The results met my expectations by illustrating that EI can promote one's thriving experience and play a positive impact on safety behaviours, and EI's influence can be strengthened by career adaptability. While workplace thriving has been widely studied due to its influence on an individual's work performance (Porath et al., 2012), it is essential to acknowledge the limitations of this thesis, which primarily focused on personal moderators, neglecting the potential influence of contextual moderators. This opens a new direction for future research to encompass situational conditions as moderators, the factors that may attenuate or strengthen the relationship between EI, thriving, and safety performance. For future research, I suggest that practitioners include additional constructs such as engagement, burnout, and proactive behaviours to enrich the understanding of the relationship between EI and safety performance. This approach will contribute to a more comprehensive exploration of the subject matter.

Future research should continue to explore the dynamic interactions between EI, situational awareness, and safety performance, with a particular focus on identifying

additional mediators and moderators that could influence these relationships. For instance, organizational culture and leadership styles could be examined as potential moderators, providing a more holistic understanding of how EI operates within different organizational contexts. Additionally, exploring the role of EI in other safety-critical industries beyond aviation could help to generalize the findings and further validate the theoretical framework proposed in this research.

Other Issues

Given the nature of cross-sectional collected data, it is challenging to draw a causal conclusion regarding the relationships between EI, situational awareness, thriving, and safety performance. To address this limitation, future research may apply a longitudinal research design associated with an experimental study to investigate the dynamic relationships among these variables. For instance, they may explore whether the influence of EI on safety performance will be strengthened following targeted EI training. By employing a longitudinal approach, surveys could be collected from the same sample group both before and after the specified EI training course. This before-and-after comparison within the same group could yield valuable insights into the potential effects of EI training on safety performance.

Conclusion

Through three studies, this thesis established and examined an overarching moderating mediation framework that aimed to explain how and when EI could affect an individual's safety performance behaviour. Despite the large amount of evidence showing EI's important implication on work performance across various domains, empirical studies specifically addressing the influence of EI on safety performance have been relatively scarce. The literature review narrowed my research scope to focus on EI's indirect effect on safety performance while considering constraints at both organisational and personal levels. Study 1 first verified that EI does indeed exert direct influence on safety performance. The results

show that EI serves as a critical enabler of situational awareness and thriving, subsequently improving safety participation and compliance behaviours.

Study 2 examined how EI can be enabled to play a greater role in the face of adverse conditions. Consistent with TAT (Tett & Burnett, 2003), when individuals perceive inadequate training provided by the organisation, their inherent trait-related abilities, such as emotional competencies, were activated in response to these setbacks. This activation enables them to attain a heightened level of situational awareness, therefore maintain effective performance levels. These findings make contributions to the safety literature by introducing a novel situational awareness-based mechanism. By doing so, it deepens our understanding of how EI improves safety outcomes, particularly when individuals are confronted with negative influences. This exploration added valuable insights to the existing body of knowledge in which EI interacts with situational awareness to boost safety performance.

Finally, an additional moderating mediation pathway was explored, investigating the influence of EI on safety performance through the mediating factor of thriving with a boundary condition of career adaptability. The results showed that EI facilitated the development of a sense of thriving, which in turn enhanced employees' safety-related behaviours, and that EI's effect on thriving can be enhanced by higher level of career adaptability. These findings contribute to the existing workplace safety literature by revealing a fresh perspective on improving safety based on the SEMT.

In summary, this thesis has examined the EI-safety performance relationship by establishing a complex framework, encompassing multiple mediators and moderators. The findings not only extend the EI-performance link to a safety-related context, but also provide practical insights for organisational practitioners. Future research is encouraged to advance the theoretical and empirical foundation associated with the EI and performance linkage. Focusing on other latent personal and contextual factors that either hinder or promote the

influence of EI behaviour in safety contexts will contribute to a more thorough understanding of how EI relates to safety performance.

ReferencesUncategorized References

(IATA), I. A. T. A. (2023). *IATA Annual Safety Report*. International Air Transport Association (IATA). https://www.iata.org/en/publications/safety-report/

(ICAO), I. C. A. O. (2022). *ICAO Safety Report*.

Abraham, R. (2000). The role of job control as a moderator of emotional dissonance and emotional intelligence–outcome relationships. *The Journal of Psychology*, *134*(2), 169-184. https://doi.org/10.1080/00223980009600860

Abraham, R. (2004). Emotional competence as antecedent to performance: A contingency framework. *Genetic, Social, and General Psychology Monographs*, *130*(2), 117-145. https://doi.org/10.3200/MONO.130.2.117-145

Abu, F., Gholami, H., Saman, M. Z. M., Zakuan, N., & Streimikiene, D. (2019). The implementation of lean manufacturing in the furniture industry: A review and analysis on the motives, barriers, challenges, and the applications. *Journal of Cleaner Production*, *234*, 660-680. https://doi.org/10.1016/j.jclepro.2019.06.279

Afthanorhan, A., Awang, Z., Mamat, M., Sultan, U., & Abidin, Z. (2016). A comparative study between GSCA-SEM and PLS-SEM. *MJ Journal on Statistics and Probability*, *1*(1), 63-72.

Afthanorhan, W. (2013). A comparison of partial least square structural equation modeling (PLS-SEM) and covariance based structural equation modeling (CB-SEM) for confirmatory factor analysis. *International Journal of Engineering Science and Innovative Technology*, *2*(5), 198-205.

Agnoli, S., Mancini, G., Pozzoli, T., Baldaro, B., Russo, P. M., & Surcinelli, P. (2012). The interaction between emotional intelligence and cognitive ability in predicting scholastic performance in school-aged children. *Personality and Individual Differences*, *53*(5), 660-665. https://doi.org/10.1016/j.paid.2012.05.020

Aguinis, H., & Kraiger, K. (2009). Benefits of Training and Development for Individuals and Teams, Organizations, and Society. *Annual Review of Psychology*, *60*, 451-474. https://doi.org/10.1146/annurev.psych.60.110707.163505

Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*. Sage Publications, Inc.

Al-Ghazali, B. M. (2020). Transformational leadership, career adaptability, job embeddedness and perceived career success: A serial mediation model. *Leadership & Organization Development Journal*, *41*(8), 993 - 1013. https://doi.org/10.1108/LODJ-10-2019-0455

Ali, M., Aziz, S., Pham, T. N., Babalola, M. T., & Usman, M. (2020). A positive human health perspective on how spiritual leadership weaves its influence on employee safety performance: The role of harmonious safety passion. *Safety Science*, *131*, 104923. https://doi.org/10.1016/j.ssci.2020.104923

Alotaibi, S. M., Amin, M., & Winterton, J. (2020). Does emotional intelligence and empowering leadership affect psychological empowerment and work engagement? *Leadership & Organization Development Journal*. https://doi.org/10.1108/LODJ-07-2020-0313

Alothmany, R., Jiang, Z., & Manoharan, A. (2023). Linking high-performance work systems to affective commitment, job satisfaction, and career satisfaction: Thriving as a mediator and wasta as a moderator. *The International Journal of Human Resource Management*, *34*(19), 3787-3824.

Amarnani, R. K., Lajom, J. A. L., Restubog, S. L. D., & Capezio, A. (2020). Consumed by obsession: Career adaptability resources and the performance consequences of obsessive passion and harmonious passion for work. *Human Relations*, *73*(6), 811-836. https://doi.org/10.1177/0018726719844812

Analoui, F. (2000). What motivates senior managers? *Journal of Managerial Psychology*, *15*, 324-340. https://doi.org/10.1108/02683940010330984

Andrei, D., Grech, M. R., Griffin, M., & Neal, A. (2020). Assessing the determinants of safety culture in the maritime industry. *International Journal of Maritime Engineering*, *162*(A4).

Andrei, D. M., Griffin, M. A., Grech, M., & Neal, A. (2020). How demands and resources impact chronic fatigue in the maritime industry. The mediating effect of acute fatigue, sleep quality and recovery. *Safety Science*, *121*, 362-372. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000758

Arzahan, I. S. N., Ismail, Z., & Yasin, S. M. (2022). Safety culture, safety climate, and safety performance in healthcare facilities: A systematic review. *Safety Science*, *147*, 105624. https://doi.org/10.1016/j.ssci.2021.105624

Asad, M., Kashif, M., Sheikh, U. A., Asif, M. U., George, S., & Khan, G. U. H. (2022). Synergetic effect of safety culture and safety climate on safety performance in SMEs: Does transformation leadership have a moderating role? *International Journal of Occupational Safety and Ergonomics*, *28*(3), 1858-1864. https://doi.org/10.1080/10803548.2021.1942657

Ashkanasy, N. M., & Humphrey, R. H. (2011). Current emotion research in organizational behavior. *Emotion Review*, *3*(2), 214-224. https://doi.org/10.1177/1754073910391684

Astrachan, C. B., Patel, V. K., & Wanzenried, G. (2014). A comparative study of CB-SEM and PLS-SEM for theory development in family firm research. *Journal of Family Business Strategy*, *5*(1), 116-128.

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: state of the art. *Journal of Managerial Psychology*, *22*(3), 309-328. https://doi.org/10.1108/02683940710733115

Bakker, A. B., Demerouti, E., De Boer, E., & Schaufeli, W. B. (2003). Job demands and job resources as predictors of absence duration and frequency. *Journal of Vocational Behavior*, *62*(2), 341-356. https://doi.org/10.1016/S0001-8791(02)00030-1

Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the job demands-resources model to predict burnout and performance. *Human Resource Management*, *43*(1), 83-104. https://doi.org/10.1002/hrm.20004

Bamel, U. K., Pandey, R., & Gupta, A. (2020). Safety climate: Systematic literature network analysis of 38 years (1980-2018) of research. *Accident Analysis & Prevention*, *135*, 105387. https://doi.org/10.1016/j.aap.2019.105387

Bandalos, D. L. (2002). The effects of item parceling on goodness-of-fit and parameter estimate bias in structural equation modeling. *Structural Equation Modeling*, *9*(1), 78-102. https://doi.org/10.1207/S15328007SEM0901_5

Bar-On, R. (1997). The Emotional Quotient Inventory (EQ-i): A test of emotional intelligence. *Toronto: Multi-Health Systems*, *28*.

Bar-On, R. E., & Parker, J. D. (2000). *The handbook of emotional intelligence: Theory, development, assessment, and application at home, school, and in the workplace*. Jossey-Bass.

Barbaranelli, C., Petitta, L., & Probst, T. M. (2015). Does safety climate predict safety performance in Italy and the USA? Cross-cultural validation of a theoretical model of safety climate. *Accid Anal Prev*, *77*, 35-44. https://doi.org/10.1016/j.aap.2015.01.012

Barney, C. E., & Elias, S. M. (2010). Flex-time as a moderator of the job stress-work motivation relationship: A three nation investigation. *Personnel Review*, *39*(4), 487-502. https://doi.org/10.1108/00483481011045434

Baron, R. M. (2006). The Bar-On model of emotional-social intelligence (ESI). *Psicothema*, *18*(1), 13-25.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182. https://doi.org/10.1037/0022-3514.51.6.1173

Barreiro, C. A., & Treglown, L. (2020). What makes an engaged employee? A facet-level approach to trait emotional intelligence as a predictor of employee engagement. *Personality and Individual Differences*, *159*, 109892. https://doi.org/10.1016/j.paid.2020.109892

Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment*, *9*(1-2), 9-30. https://doi.org/10.1111/1468-2389.00160

Bartel, A. P. (1995). Training, wage growth, and job performance: Evidence from a company database. *Journal of Labor Economics*, *13*(3), 401-425. https://doi.org/10.3386/w4027

Baumeister, R. F., Zell, A. L., & Tice, D. M. (2007). *How emotions facilitate and impair self-regulation* (Vol. 1). The Guilford Press.

Bayighomog, S. W., & Arasli, H. (2022). Reviving employees' essence of hospitality through spiritual wellbeing, spiritual leadership, and emotional intelligence. *Tourism Management*, *89*, 104406. https://doi.org/10.1016/j.tourman.2021.104406

Bayram, M., Arpat, B., & Ozkan, Y. (2021). Safety priority, safety rules, safety participation and safety behaviour: The mediating role of safety training. *International Journal of Occupational Safety and Ergonomics*, 1-11. https://doi.org/10.1080/10803548.2021.1959131

Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology*, *90*(6), 1054-1068. https://doi.org/10.1037/0021-9010.90.6.1054

Bedny, G., & Meister, D. (1999). Theory of activity and situation awareness. *International Journal of Cognitive Ergonomics*, *3*(1), 63-72.

Belcastro, C. M., & Foster, J. V. (2010). Aircraft loss-of-control accident analysis. Proceedings of AIAA Guidance, Navigation and Control Conference, Toronto, Canada, Paper No. AIAA-2010-8004,

Belogolovsky, E., Bamberger, P. A., & Bacharach, S. B. (2012). Workforce disengagement stressors and retiree alcohol misuse: The mediating effects of sleep problems and the moderating effects of gender. *Human Relations*, *65*(6), 705-728. https://doi.org/10.1177/0018726711435250

Bensonch, C., Argyropoulos, C. D., Dimopoulos, C., Mikellidou, C. V., & Boustras, G. (2022). Analysis of safety climate factors and safety compliance relationships in the oil and gas industry. *Safety Science*, *151*, 105744. https://doi.org/10.1080/10803548.2021.1942657

Bernaards, C. A., & Sijtsma, K. (2000). Influence of imputation and EM methods on factor analysis when item nonresponse in questionnaire data is nonignorable. *Multivariate Behavioral Research*, *35*(3), 321-364. https://doi.org/10.1207/s15327906mbr3503_03

Berrocal, P. F., & Pacheco, N. E. (2006). Emotional intelligence: A theoretical and empirical review of its first 15 years of history. *Psicothema*, *18*(1), 7-12.

Beus, J. M., McCord, M. A., & Zohar, D. (2016). Workplace safety: A review and research synthesis. *Organizational Psychology Review*, *6*(4), 352-381. https://doi.org/10.1177/2041386615626243

Blickle, G., Schütte, N., & Genau, H. A. (2018). Manager psychopathy, trait activation, and job performance: A multi-source study. *European Journal of Work and Organizational Psychology*, *27*(4), 450-461. https://doi.org/10.1080/1359432x.2018.1475354

Boeing. (2004). *Statistical Summary of Commercial Jet Airplane Accidents Worldwide Operations 1959 - 2003*

SKYbrary. https://skybrary.aero/sites/default/files/bookshelf/3809.pdf

Bogdane, R., Gorbacovs, O., Sestakovs, V., & Arandas, I. (2019). Development of a model for assessing the level of flight safety in an airline using concept of risk. *Procedia Computer Science*, *149*, 365-374. https://doi.org/10.1016/j.procs.2019.01.150

Bolstad, C. A., Endsley, M. R., Costello, A. M., & Howell, C. D. (2010). Evaluation of computer-based situation awareness training for general aviation pilots. *The International Journal of Aviation Psychology*, *20*(3), 269-294.

Borman, W. C., & Motowidlo, S. (1993). Expanding the criterion domain to include elements of contextual performance. *Personnel Selection in Organizations (pp. 71-98); San Francisco: Jossey-Bass*.

Boyatzis, R. E., Goleman, D., & Rhee, K. (2000). Clustering competence in emotional intelligence: Insights from the Emotional Competence Inventory (ECI). *Handbook of Emotional Intelligence*, 343-362.

Bozionelos, N., Lin, C.-H., & Lee, K. Y. (2020). Enhancing the sustainability of employees' careers through training: The roles of career actors' openness and of supervisor support. *Journal of Vocational Behavior*, *117*, 103333. https://doi.org/10.1016/j.jvb.2019.103333

Bozionelos, N., & Singh, S. K. (2017). The relationship of emotional intelligence with task and contextual performance: More than it meets the linear eye. *Personality and Individual Differences*, *116*, 206-211. https://doi.org/10.1016/j.paid.2017.04.059

Brackett, M. A., Rivers, S. E., & Salovey, P. (2011). Emotional intelligence: Implications for personal, social, academic, and workplace success. *Social and Personality Psychology Compass*, *5*(1), 88-103. https://doi.org/10.1111/j.1751-9004.2010.00334.x

Brackett, M. A., Rivers, S. E., Shiffman, S., Lerner, N., & Salovey, P. (2006). Relating emotional abilities to social functioning: A comparison of self-report and performance measures of emotional intelligence. *Journal of Personality and Social Psychology*, *91*(4), 780-795. https://doi.org/10.1037/0022-3514.91.4.780

Brenda, G. (2018). *In China, female pilots strain to hold up half the sky*. https://www.reuters.com/article/us-china-airshow-women-pilots/in-china-female-pilots-strain-to-hold-up-half-the-sky-idUSKCN1NA2SP

Brislin, R. W. (1980). Translation and content analysis of oral and written materials. *Methodology*, 389-444. https://doi.org/10.4236/adr.2022.103030

Brown, K. G. (2001). Using computers to deliver training: Which employees learn and why? *Personnel Psychology*, *54*(2), 271-296. https://doi.org/10.1111/J.1744-6570.2001.TB00093.X

Brown, T. A., & Moore, M. T. (2012). Confirmatory factor analysis. *Handbook of structural equation modeling*, *361*, 379.

Burke, M. J., Salvador, R. O., Smith-Crowe, K., Chan-Serafin, S., Smith, A., & Sonesh, S. (2011). The dread factor: How hazards and safety training influence learning and performance. *Journal of Applied Psychology*, *96*(1), 46. https://doi.org/10.1037/a0021838

Burke, M. J., Sarpy, S. A., Tesluk, P. E., & SMITH-CROWE, K. (2002). General safety performance: A test of a grounded theoretical model. *Personnel Psychology*, *55*(2), 429-457.

Butcher, J. N. (2002). Assessing pilots with 'the wrong stuff': A call for research on emotional health factors in commercial aviators. *International Journal of Selection and Assessment*, *10*(1-2), 168-184.

Byrne, M. D., & Kirlik, A. (2005). Using computational cognitive modeling to diagnose possible sources of aviation error. *The International Journal of Aviation Psychology*, *15*(2), 135-155.
Cahill, J., Cullen, P., Anwer, S., Wilson, S., & Gaynor, K. (2021). Pilot work related stress (WRS), effects on wellbeing and mental health, and coping methods. *The International Journal of Aerospace Psychology*, *31*(2), 87-109.
Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C. E. (1993). A theory of performance. *Personnel selection in organizations*, *3570*.
Campo, M., Laborde, S., Martinent, G., Louvet, B., & Nicolas, M. (2019). Emotional intelligence (EI) training adapted to the international preparation constraints in rugby: Influence of EI trainer status on EI training effectiveness. *Frontiers in Psychology*, *10*, 1939.
Caponecchia, C., Zheng, W. Y., & Regan, M. A. (2018). Selecting trainee pilots: Predictive validity of the WOMBAT situational awareness pilot selection test. *Applied Ergonomics*, *73*, 100-107. https://doi.org/10.1016/J.APERGO.2018.06.004
Cardenas, R. A., Major, D. A., & Bernas, K. H. (2004). Exploring work and family distractions: Antecedents and outcomes. *International Journal of Stress Management*, *11*(4), 346-365. https://doi.org/10.1037/1072-5245.11.4.346
Carmeli, A. (2003). The relationship between emotional intelligence and work attitudes, behavior and outcomes: An examination among senior managers. *Journal of Managerial Psychology*.
Carmeli, A., Meitar, R., & Weisberg, J. (2006). Self-leadership skills and innovative behavior at work. *International Journal of Manpower*.
Cheng, T., Huang, G.-h., Lee, C., & Ren, X. (2012). Longitudinal effects of job insecurity on employee outcomes: The moderating role of emotional intelligence and the leader-member exchange. *Asia Pacific Journal of Management*, *29*(3), 709-728. https://doi.org/10.1007/s10490-010-9227-3
Cheng, Y.-N., Yen, C.-L., & Chen, L. H. (2012). Transformational leadership and job involvement: The moderation of emotional contagion. *Military Psychology*, *24*(4), 382-396. https://doi.org/10.1080/08995605.2012.695261
Cheng, Y., & Waldenberger, F. (2013). Does training affect individuals' turnover intention? Evidence from China. *Journal of Chinese Human Resources Management*.
Cherniss, C. (2010). Emotional intelligence: Toward clarification of a concept. *Industrial and Organizational Psychology*, *3*(2), 110-126.
Christensen-Salem, A., Walumbwa, F. O., Hsu, C. I.-C., Misati, E., Babalola, M. T., & Kim, K. (2021). Unmasking the creative self-efficacy–creative performance relationship: the roles of thriving at work, perceived work significance, and task interdependence. *The International Journal of Human Resource Management*, *32*(22), 4820-4846. https://doi.org/10.1080/09585192.2019.1710721
Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology*, *94*(5), 1103-1127. https://doi.org/10.1037/a0016172
Ciarrochi, J. V., Chan, A. Y., & Caputi, P. (2000). A critical evaluation of the emotional intelligence construct. *Personality and Individual Differences*, *28*(3), 539-561.
Clarke, S. (2006). The relationship between safety climate and safety performance: a meta-analytic review. *J Occup Health Psychol*, *11*(4), 315-327. https://doi.org/10.1037/1076-8998.11.4.315
Clarke, S. (2013). Safety leadership: A meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. *Journal of*

Occupational and Organizational Psychology, *86*(1), 22-49. https://doi.org/doi.org/10.1111/j.2044-8325.2012.02064.x

Clarke, S., & Robertson, I. (2005). A meta-analytic review of the Big Five personality factors and accident involvement in occupational and non-occupational settings. *Journal of Occupational and Organizational Psychology*, *78*(3), 355-376.

Clarke, S., & Robertson, I. (2008). An Examination of the Role of Personality in Work Accidents Using Meta-analysis. *Applied Psychology*, *57*(1), 94-108. https://doi.org/10.1111/j.1464-0597.2007.00267.x

Cline, P. E. (2018). Human error analysis of helicopter emergency medical services (HEMS) accidents using the human factors analysis and classification system (HFACS). *Journal of Aviation/Aerospace Education & Research*, *28*(1), 43.

Coetzee, M., & Beukes, C. J. (2010). Employability, emotional intelligence and career preparation support satisfaction among adolescents in the school-to-work transition phase. *Journal of Psychology in Africa*, *20*(3), 439-446. https://doi.org/10.1080/14330237.2010.10820396

Coetzee, M., & Harry, N. (2014). Emotional intelligence as a predictor of employees' career adaptability. *Journal of Vocational Behavior*, *84*(1), 90-97. https://doi.org/10.1016/j.jvb.2013.09.001

Conte, J. M. (2005). A review and critique of emotional intelligence measures. *Journal of Organizational Behavior*, *26*(4), 433-440. https://doi.org/10.1002/job.319

Conway, J. M., & Lance, C. E. (2010). What reviewers should expect from authors regarding common method bias in organizational research. *Journal of Business and Psychology*, *25*(3), 325-334.

Cooper, M. D. (2000). Towards a model of safety culture. *Safety Science*, *36*(2), 111-136.

Côté, S. (2014). Emotional intelligence in organizations. *Annu. Rev. Organ. Psychol. Organ. Behav.*, *1*(1), 459-488.

Cote, S., & Miners, C. T. (2006). Emotional intelligence, cognitive intelligence, and job performance. *Administrative Science Quarterly*, *51*(1), 1-28. https://doi.org/doi.org/10.2189/asqu.51.1.1

Crant, J. M. (1995). The proactive personality scale and objective job performance among real estate agents. *Journal of Applied Psychology*, *80*(4), 532-537. https://doi.org/10.1037/0021-9010.80.4.532

Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J., & Ketchen Jr, D. J. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of Applied Psychology*, *96*(3), 443.

Crowe, R. P., Fernandez, A. R., Pepe, P. E., Cash, R. E., Rivard, M. K., Wronski, R., Anderson, S. E., Hogan, T. H., Andridge, R. R., & Panchal, A. R. (2020). The association of job demands and resources with burnout among emergency medical services professionals. *Journal of the American College of Emergency Physicians Open*, *1*(1), 6-16. https://doi.org/10.1002/emp2.12014

Curcuruto, M., Parker, S. K., & Griffin, M. A. (2019). Proactivity towards workplace safety improvement: an investigation of its motivational drivers and organizational outcomes. *European Journal of Work and Organizational Psychology*, *28*(2), 221-238.

Daus, C. S., & Ashkanasy, N. M. (2005). The case for the ability-based model of emotional intelligence in organizational behavior. *Journal of Organizational Behavior*, *26*(4), 453-466.

Dawson, J. F. (2014). Moderation in management research: What, why, when, and how. *Journal of Business and Psychology*, *29*(1), 1-19. https://doi.org/10.1007/S10869-013-9308-7

Day, A. L., & Carroll, S. A. (2004). Using an ability-based measure of emotional intelligence to predict individual performance, group performance, and group citizenship behaviours. *Personality and Individual Differences*, *36*(6), 1443-1458. https://doi.org/10.1016/s0191-8869(03)00240-x

De Jong, M. G., Pieters, R., & Fox, J.-P. (2010). Reducing social desirability bias through item randomized response: An application to measure underreported desires. *Journal of Marketing Research*, *47*(1), 14-27.

De Sant, D. A. L. M., & De Hilal, A. V. G. (2021). The impact of human factors on pilots' safety behavior in offshore aviation companies: A brazilian case. *Safety Science*, *140*, 105272. https://doi.org/10.1016/j.ssci.2021.105272

Dermol, V., & Čater, T. (2013). The influence of training and training transfer factors on organisational learning and performance. *Personnel Review*.

Desti, K., & Shanthi, R. (2015). A study on emotional intelligence at work place. *European journal of Business and Management*, *7*, 147-154.

Di Fabio, A., & Saklofske, D. H. (2018). The contributions of personality and emotional intelligence to resiliency. *Personality and Individual Differences*, *123*, 140-144.

Drigas, A., & Papoutsi, C. (2019). Emotional Intelligence as an Important Asset for HR in Organizations: Leaders and Employees. *International Journal of Advanced Corporate Learning*, *12*(1).

Du, L., Goerlandt, F., Banda, O. A. V., Huang, Y., Wen, Y., & Kujala, P. (2020). Improving stand-on ship's situational awareness by estimating the intention of the give-way ship. *Ocean Engineering*, *201*, 107 - 110. https://doi.org/10.1016/j.ssci.2020.10493010.1016/j.ssci.2020.104930

Dulewicz, V., & Higgs, M. (2000). Emotional intelligence: the key to future successful corporate leadership? *Journal of general management*, *25*(3), 1-14.

Durso, F. T., Hackworth, C. A., Truitt, T. R., Crutchfield, J., & Nikolic, D. (1999). *Situation Awareness As a Predictor of Performance in En Route Air Traffic Controllers* (D. C. Office of Aviation Medicine Washington, Ed.). National Technical Information Service. https://doi.org/10.2514/atcq.6.1.1

Dysvik, A., & Kuvaas, B. (2008). The relationship between perceived training opportunities, work motivation and employee outcomes. *International Journal of Training and Development*, *12*(3), 138-157. https://doi.org/10.1111/j.1468-2419.2008.00301.x

Elahi, N. S., Abid, G., Arya, B., & Farooqi, S. (2020). Workplace behavioral antecedents of job performance: Mediating role of thriving. *The Service Industries Journal*, *40*(11-12), 755-776. https://doi.org/10.1080/02642069.2019.1638369

Elfenbein, H. A., & Eisenkraft, N. (2010). The relationship between displaying and perceiving nonverbal cues of affect: A meta-analysis to solve an old mystery. *Journal of Personality and Social Psychology*, *98*(2), 301.

Elnaga, A., & Imran, A. (2013). The effect of training on employee performance. *European journal of Business and Management*, *5*(4), 137-147.

Emmerling, R. J., & Cherniss, C. (2003). Emotional Intelligence and the Career Choice Process. *Journal of Career Assessment*, *11*(2), 153-167. https://doi.org/10.1177/1069072703011002003

Endsley, M. R. (1988). Design and evaluation for situation awareness enhancement. *Proceedings of the Human Factors Society Annual Meeting 32*(2), 97-101. https://doi.org/10.1177/154193128803200221

Endsley, M. R. (1995a). Measurement of situation awareness in dynamic systems. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, *37*(1), 65-84.

Endsley, M. R. (1995b). Toward a theory of situation awareness in dynamic systems. *Human Factors*, *37*(1), 32-64.

Endsley, M. R. (1995c). Toward a theory of situation awareness in dynamic systems. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, *37*(1), 32-64.
Endsley, M. R. (1999a). *Situation awareness and human error: Designing to support human performance* Proceedings of the high consequence systems surety conference, Albuquerque, NM.
Endsley, M. R. (1999b). Situation awareness in aviation systems. *Handbook of Aviation Human Factors*, 257-276.
Endsley, M. R. (2000). *Theoretical underpinnings of situation awareness: A critical review*. Lawrence Erlbaum Associates.
Endsley, M. R. (2015a). Final reflections situation awareness models and measures. *Journal of Cognitive Engineering and Decision Making*, *9*(1), 101-111.
Endsley, M. R. (2015b). Situation Awareness Misconceptions and Misunderstandings. *Journal of Cognitive Engineering and Decision Making*, *9*(1), 4-32. https://doi.org/10.1177/1555343415572631
Endsley, M. R. (2015c). Situation awareness: operationally necessary and scientifically grounded. *Cognition, Technology & Work*, *17*(2), 163-167. https://doi.org/10.1007/s10111-015-0323-5
Endsley, M. R. (2018). Automation and situation awareness. In *Automation and human performance* (pp. 163-181). CRC Press.
Endsley, M. R. (2019). The divergence of objective and subjective situation awareness: A meta-analysis. *Journal of Cognitive Engineering and Decision Making*, 1555343419874248.
Endsley, M. R. (2021). Situation Awareness. In G. Salvendy (Ed.), *Handbook of human factors and ergonomics* (pp. 434-455). John Wiley & Sons, Inc.,.
Endsley, M. R., & Robertson, M. M. (2000). *Training for situation awareness in individuals and teams*. Lawrence Erlbaum Associates.
Endsley, M. R., Sollenberger, R., Nakata, A., & Stein, E. S. (2000). *Situation awareness in air traffic control: Enhanced displays for advanced operations*.
Evans, B., Glendon, A. I., & Creed, P. A. (2007). Development and initial validation of an Aviation Safety Climate Scale. *Journal of Safety Research*, *38*(6), 675-682. https://doi.org/10.1016/j.jsr.2007.09.005
Falco, A., Girardi, D., Dal Corso, L., Yıldırım, M., & Converso, D. (2021). The perceived risk of being infected at work: An application of the job demands–resources model to workplace safety during the COVID-19 outbreak. *PloS one*, *16*(9), e0257197. https://doi.org/10.1371/journal.pone.0257197
Farh, C. I., Seo, M.-G., & Tesluk, P. E. (2012). Emotional intelligence, teamwork effectiveness, and job performance: The moderating role of job context. *Journal of Applied Psychology*, *97*(4), 890-900. https://doi.org/10.1037/a0027377
Fernandes, A., & Braarud, P. Ø. (2015). Exploring measures of workload, situation awareness, and task performance in the Main Control Room. *Procedia Manufacturing*, *3*, 1281-1288. https://doi.org/10.1016/j.promfg.2015.07.273
Fernández-Muñiz, B., Montes-Peón, J. M., & Vázquez-Ordás, C. J. (2014). Safety leadership, risk management and safety performance in Spanish firms. *Safety Science*, *70*, 295-307. https://doi.org/10.1016/j.ssci.2014.07.010
Fiori, M., Bollmann, G., & Rossier, J. (2015). Exploring the path through which career adaptability increases job satisfaction and lowers job stress: The role of affect. *Journal of Vocational Behavior*, *91*, 113-121.
Fiori, M., & Vesely-Maillefer, A. K. (2018). Emotional intelligence as an ability: Theory, Challenges, and New Directions. In *Emotional Intelligence in Education* (pp. 23-47). Springer. https://doi.org/10.1007/978-3-319-90633-1_17

Fukuda, E., Saklofske, D. H., Tamaoka, K., & Lim, H. (2012). Factor structure of the Korean version of Wong and Law's Emotional Intelligence Scale. *Assessment*, *19*(1), 3-7.
Gao, F. (2016). *Negotiation from" in the air" to" on the ground": employment relation between pilots and C Airlines in China* Massachusetts Institute of Technology].
Gao, Y., Shi, J., Niu, Q., & Wang, L. (2013). Work–family conflict and job satisfaction: Emotional intelligence as a moderator. *Stress and Health*, *29*(3), 222-228. https://doi.org/10.1002/smi.2451
George, J. M. (2000). Emotions and leadership: The role of emotional intelligence. *Human relations*, *53*(8), 1027-1055. https://doi.org/10.1177/0018726700538001
Gerbasi, A., Porath, C. L., Parker, A., Spreitzer, G., & Cross, R. (2015). Destructive de-energizing relationships: How thriving buffers their effect on performance. *Journal of Applied Psychology*, *100*(5), 1423.
Gilar-Corbi, R., Pozo-Rico, T., Sánchez, B., & Castejón, J.-L. (2019). Can emotional intelligence be improved? A randomized experimental study of a business-oriented EI training program for senior managers. *PloS one*, *14*(10), e0224254.
Glendon, A. I., & Litherland, D. K. (2001). Safety climate factors, group differences and safety behaviour in road construction. *Safety Science*, *39*(3), 157-188. https://doi.org/10.1016/s0925-7535(01)00006-6
Glomb, T. M., Duffy, M. K., Bono, J. E., & Yang, T. (2011). Mindfulness at work. In *Research in personnel and human resources management* (Vol. 30, pp. 115-157). Emerald Group Publishing Limited.
Goertzen, M. J. (2017). *Introduction to quantitative research and data* (Vol. 53).
Goh, Z., Eva, N., Kiazad, K., Jack, G. A., De Cieri, H., & Spreitzer, G. M. (2022). An integrative multilevel review of thriving at work: Assessing progress and promise. *Journal of Organizational Behavior*, *43*(2), 197-213.
Goldenberg, I., Matheson, K., & Mantler, J. (2006). The assessment of emotional intelligence: a comparison of performance-based and self-report methodologies. *J Pers Assess*, *86*(1), 33-45. https://doi.org/10.1207/s15327752jpa8601_05
Goleman, D. (1995). Emotional intelligence: Why it can matter more than IQ New York: Bantam Dell. In: Random House.
Goleman, D. (1998). *Working with Emotional Intelligence*. Bantam.
Goleman, D. (2001). An EI-based theory of performance. *The emotionally intelligent workplace: How to select for, measure, and improve emotional intelligence in individuals, groups, and organizations*, *1*, 27-44.
Gong, Z., Chen, Y., & Wang, Y. (2019). The influence of emotional intelligence on job burnout and job performance: Mediating effect of psychological capital. *Frontiers in Psychology*, *10*, 2707. https://doi.org/10.3389/fpsyg.2019.02707
Gong, Z., Zhang, Y., Ma, J., Liu, Y., & Zhao, Y. (2018). Effects of work passion on turnover intention for Chinese government employees: The dualistic model of passion perspective. *Journal of Management & Organization*, *26*(4), 502-518. https://doi.org/10.1017/jmo.2017.71
Griffin, M. A., & Curcuruto, M. (2016). Safety climate in organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, *3*, 191-212. https://doi.org/10.1146/annurev-orgpsych-041015-062414
Griffin, M. A., & Hu, X. (2013). How leaders differentially motivate safety compliance and safety participation: The role of monitoring, inspiring, and learning. *Safety Science*, *60*, 196-202. https://doi.org/10.1016/j.ssci.2013.07.019
Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of*

Occupational Health Psychology, *5*(3), 347-358. https://doi.org/https://doi.org/10.1037//1076-8998.5.3.347
Grobelny, J., Radke, P., & Paniotova-Maczka, D. (2021). Emotional intelligence and job performance: a meta-analysis. *International Journal of Work Organisation and Emotion*, *12*(1), 1-47.
Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271 - 299.
Guan, X., & Frenkel, S. (2018). How perceptions of training impact employee performance: Evidence from two Chinese manufacturing firms. *Personnel Review*. https://doi.org/10.1108/PR-05-2017-0141
Guan, X., & Frenkel, S. (2019). How perceptions of training impact employee performance: Evidence from two Chinese manufacturing firms. *Personnel Review*.
Guan, Y., Guo, Y., Bond, M. H., Cai, Z., Zhou, X., Xu, J., Zhu, F., Wang, Z., Fu, R., & Liu, S. (2014). New job market entrants' future work self, career adaptability and job search outcomes: Examining mediating and moderating models. *Journal of Vocational Behavior*, *85*(1), 136-145. https://doi.org/10.1016/j.jvb.2014.05.003
Guan, Y., Wang, F., Liu, H., Ji, Y., Jia, X., Fang, Z., Li, Y., Hua, H., & Li, C. (2015). Career-specific parental behaviors, career exploration and career adaptability: A three-wave investigation among Chinese undergraduates. *Journal of Vocational Behavior*, *86*, 95-103.
Guan, Y., Zhou, W., Ye, L., Jiang, P., & Zhou, Y. (2015). Perceived organizational career management and career adaptability as predictors of success and turnover intention among Chinese employees. *Journal of Vocational Behavior*, *88*, 230-237. https://doi.org/10.1016/j.jvb.2015.04.002
Gugerty, L. J. (1997). Situation awareness during driving: Explicit and implicit knowledge in dynamic spatial memory. *Journal of Experimental Psychology: Applied*, *3*(1), 42-66. https://doi.org/https://doi.org/10.1037/1076-898X.3.1.42
Guo, B. H., Yiu, T. W., & González, V. A. (2016). Predicting safety behavior in the construction industry: Development and test of an integrative model. *Safety Science*, *84*, 1-11. https://doi.org/10.1016/j.ssci.2015.11.020
Guo, X., Chen, Y., Si, Q., & Wang, Y. (2021). Evolution mechanism on the unsafe behavioural risks of general aviation pilots. *Engineering Economics*, *32*(2), 104-117.
Haenggli, M., & Hirschi, A. (2020). Career adaptability and career success in the context of a broader career resources framework. *Journal of Vocational Behavior*, *119*, 103414.
Hahn, M. H., & Lee, K. C. (2013). An empirical analysis of the effect of social and emotional intelligence on individual creativity through exploitation and exploration. In *Digital Creativity* (pp. 79-98). Springer. https://doi.org/10.1007/978-1-4614-5749-7_6
Haibo, Y., Xiaoyu, G., Xiaoming, Z., & Zhijin, H. (2018). Career adaptability with or without career identity: how career adaptability leads to organizational success and individual career success? *Journal of Career Assessment*, *26*(4), 717-731.
Hamtiaux, A., Houssemand, C., & Vrignaud, P. (2013). Individual and career adaptability: Comparing models and measures. *Journal of Vocational Behavior*, *83*(2), 130-141. https://doi.org/10.1016/j.jvb.2013.03.006
Hansez, I., & Chmiel, N. (2010). Safety behavior: Job demands, job resources, and perceived management commitment to safety. *Journal of Occupational Health Psychology*, *15*(3), 267.
Hardy, D. J., & Parasuraman, R. (1997). Cognition and flight performance in older pilots. *Journal of Experimental Psychology: Applied*, *3*(4), 313-348. https://doi.org/10.1037/1076-898x.3.4.313

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach* (Vol. 51). The Guilford Press. https://doi.org/10.1111/jedm.1250
Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* Guilford Publications.
Hayes, A. F., Montoya, A. K., & Rockwood, N. J. (2017). The analysis of mechanisms and their contingencies: PROCESS versus structural equation modeling. *Australasian Marketing Journal (AMJ)*, *25*(1), 76-81. https://doi.org/10.1016/j.ausmj.2017.02.001
Haynie, J., Flynn, C. B., & Herda, D. (2020). Linking career adaptability to supervisor-rated task performance: a serial mediation model. *Career Development International*, *25*(4), 429-442. https://doi.org/10.1108/CDI-08-2019-0207
Hays, R. D., Hayashi, T., & Stewart, A. L. (1989). A five-item measure of socially desirable response set. *Educational and Psychological Measurement*, *49*(3), 629-636. https://doi.org/10.1177/001316448904900315
Hernaus, T., Černe, M., & Škerlavaj, M. (2021). The interplay between relational job design and cross-training in predicting employee job/task citizenship performance. *Human Resource Development Quarterly*, *32*(4), 625-646. https://doi.org/10.1002/hrdq.21427
Hirschi, A. (2009). Career adaptability development in adolescence: Multiple predictors and effect on sense of power and life satisfaction. *Journal of Vocational Behavior*, *74*(2), 145-155. https://doi.org/10.1016/j.jvb.2009.01.002
Hoerger, M., Chapman, B. P., Epstein, R. M., & Duberstein, P. R. (2012). Emotional intelligence: a theoretical framework for individual differences in affective forecasting. *Emotion*, *12*(4), 716. https://doi.org/10.1037/a0026724
Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. *Personnel Psychology*, *49*(2), 307-339.
Hofmann, D. A., & Stetzer, A. (1998). The role of safety climate and communication in accident interpretation: Implications for learning from negative events. *Academy of Management Journal*, *41*(6), 644-657.
Hogan, J., & Foster, J. (2013). Multifaceted Personality Predictors of Workplace Safety Performance: More Than Conscientiousness. *Human Performance*, *26*(1), 20-43. https://doi.org/10.1080/08959285.2012.736899
Hon, C. K., Chan, A. P., & Yam, M. C. (2014). Relationships between safety climate and safety performance of building repair, maintenance, minor alteration, and addition (RMAA) works. *Safety Science*, *65*, 10-19. https://doi.org/10.1016/j.ssci.2013.12.012
Hooper, D., Coughlan, J., & Mullen, M. (2008). Evaluating model fit: a synthesis of the structural equation modelling literature. 7th European Conference on research methodology for business and management studies,
Hu, L.-t., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*(4), 424.
Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118
Hu, X., Griffin, M. A., & Bertuleit, M. (2016). Modelling antecedents of safety compliance: incorporating theory from the technological acceptance model. *Safety Science*, *87*, 292-298. https://doi.org/10.1016/j.ssci.2015.12.018
Huang, C. (2020). Further improving general aviation flight safety: analysis of aircraft accidents during takeoff. *The Collegiate Aviation Review International*, *38*(1).

Huber, K. E., Hill, S. E., & Merritt, S. M. (2015). Minding the gap: Extending mindfulness to safety-critical occupations. *Industrial and Organizational Psychology*, *8*(4), 699-705. https://doi.org/101017/iop.2015.103

Hughes, D. J., & Evans, T. R. (2018). Putting 'emotional intelligences' in their place: Introducing the integrated model of affect-related individual differences. *Frontiers in Psychology*, *9*, 2155. https://doi.org/10.3389/fpsyg.2018.02155

Hunter, J., Porter, M., & Williams, B. (2020). Towards a theoretical framework for situational awareness in paramedicine. *Safety Science*, *122*, 104528.

Ifelebuegu, A. O., Martins, O. A., Theophilus, S. C., & Arewa, A. O. (2019). The Role of Emotional Intelligence Factors in Workers' Occupational Health and Safety Performance—A Case Study of the Petroleum Industry. *Safety*, *5*(2), 30. https://doi.org/10.3390/safety5020030

Iliceto, P., & Fino, E. (2017). The Italian version of the Wong-Law Emotional Intelligence Scale (WLEIS-I): A second-order factor analysis. *Personality and Individual Differences*, *116*, 274-280.

Ingram, A., Peake, W. O., Stewart, W., & Watson, W. (2019). Emotional intelligence and venture performance. *Journal of Small Business Management*, *57*(3), 780-800. https://doi.org/10.1111/jsbm.12333

Ioannou, C., Harris, D., & Dahlstrom, N. (2017). Safety management practices hindering the development of safety performance indicators in aviation service providers. *Aviation Psychology and Applied Human Factors*. https://doi.org/10.1027/2192-0923/a000118

Irwin, A., Caruso, L., & Tone, I. (2019). Thinking ahead of the tractor: Driver safety and situation awareness. *Journal of Agromedicine*, *24*(3), 288-297. https://doi.org/10.1080/1059924x.2019.1604279

Izard, C. E. (2010). The many meanings/aspects of emotion: Definitions, functions, activation, and regulation. *Emotion Review*, *2*(4), 363-370. https://doi.org/10.1177/1754073910374661

Jaiswal, N. K., & Dhar, R. L. (2017). The influence of servant leadership, trust in leader and thriving on employee creativity. *Leadership & Organization Development Journal*. https://doi.org/10.1108/LODJ-02-2015-0017

Jamal, M. (2007). Job stress and job performance controversy revisited: An empirical examination in two countries. *International Journal of Stress Management*, *14*(2), 175. https://doi.org/10.1037/1072-5245.14.2.175

Janovics, J., & Christiansen, N. (2001). Emotional intelligence in the workplace. 16th Annual Conference of the Society of Industrial and Organizational Psychology, San Diego, CA,

Jeffries, F. L. (2011). Predicting safety related attitudes in the workplace: The influence of moral maturity and emotional intelligence. *Journal of Behavioral and Applied Management*, *12*(3), 200-216. https://doi.org/10.21818/001c.17862

Jiang, K., Lepak, D. P., Hu, J., & Baer, J. C. (2012). How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms. *Academy of Management Journal*, *55*(6), 1264-1294.

Jiang, S., Chen, W., Kang, Y., Liu, J., & Kuang, W. (2021). Identifying Cognitive Mechanism Underlying Situation Awareness of Pilots' Unsafe Behaviors Using Quantitative Modeling. *International Journal of Environmental Research and Public Health*, *18*(6), 30 - 52. https://doi.org/International Journal of Environmental Research and Public Health

Jiang, Z. (2016). Emotional intelligence and career decision-making self-efficacy: Mediating roles of goal commitment and professional commitment. *Journal of Employment Counseling*, *53*(1), 30-47. https://doi.org/10.1002/joec.12026

Jiang, Z. (2017). Proactive personality and career adaptability: The role of thriving at work. *Journal of Vocational Behavior*, *98*, 85-97. https://doi.org/10.1016/j.jvb.2016.10.003
Jiang, Z., Di Milia, L., Jiang, Y., & Jiang, X. (2020). Thriving at work: A mentoring-moderated process linking task identity and autonomy to job satisfaction. *Journal of Vocational Behavior*, *118*, 103373. https://doi.org/10.1016/j.jvb.2019.103373
Jiang, Z., Jiang, Y., & Nielsen, I. (2021). Thriving and career outcomes: The roles of achievement orientation and resilience. *Human Resource Management Journal*, *31*(1), 143-164.
Jiao, Y., Dong, J., Han, J., & Sun, H. (2022). Classification and causes identification of Chinese civil aviation incident reports. *Applied Sciences*, *12*(21), 10765.
Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review*, *31*(2), 386-408. https://doi.org/10.2307/20159208
Johnston, C. S. (2018). A systematic review of the career adaptability literature and future outlook. *Journal of Career Assessment*, *26*(1), 3-30. https://doi.org/10.1177%2F1069072716679921
Jones, C. (2014). *Assessing safety culture and safety performance in a high hazard industry* University of Nottingham].
Jordan, P. J., Ashkanasy, N. M., & Hartel, C. E. (2002). Emotional intelligence as a moderator of emotional and behavioral reactions to job insecurity. *Academy of Management Review*, *27*(3), 361-372. https://doi.org/10.2307/4134384
Jordan, P. J., Dasborough, M. T., Daus, C. S., & Ashkanasy, N. M. (2010). A call to context. *Industrial and Organizational Psychology*, *3*(2), 145-148. https://doi.org/10.1111/j.1754-9434.2010.01215.x
Jordan, P. J., & Troth, A. (2011). Emotional intelligence and leader member exchange. *Leadership & Organization Development Journal*, *32*(3), 260-280. https://doi.org/10.1108/01437731111123915
Joseph, D. L., Jin, J., Newman, D. A., & O'Boyle, E. H. (2015). Why does self-reported emotional intelligence predict job performance? A meta-analytic investigation of mixed EI. *Journal of Applied Psychology*, *100*(2), 298 - 342. https://doi.org/10.1037/a0037681
Joseph, D. L., Jin, J., Newman, D. A., & O'Boyle, E. H. (2015). Why does self-reported emotional intelligence predict job performance? A meta-analytic investigation of mixed EI. *Journal of Applied Psychology*, *100*(2), 298 - 342. https://doi.org/10.1037/a0037681
Joseph, D. L., & Newman, D. A. (2010). Emotional intelligence: An integrative meta-analysis and cascading model. *Journal of Applied Psychology*, *95*(1), 54.
Jr, O. B., Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance: A meta-analysis. *Journal of Organizational Behavior*, *32*(5), 788-818. https://doi.org/10.1002/job.714
Judge, T. A., & Zapata, C. P. (2015). The person–situation debate revisited: Effect of situation strength and trait activation on the validity of the Big Five personality traits in predicting job performance. *Academy of Management Journal*, *58*(4), 1149-1179. https://doi.org/10.5465/amj.2010.0837
Kafetsios, K., & Zampetakis, L. A. (2008). Emotional intelligence and job satisfaction: Testing the mediatory role of positive and negative affect at work. *Personality and Individual Differences*, *44*(3), 712-722. https://doi.org/10.1016/j.paid.2007.10.004
Kale, U., Alharasees, O., Rohacs, J., & Rohacs, D. (2022). Aviation operators (pilots, ATCOs) decision-making process. *Aircraft Engineering and Aerospace Technology*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/AEAT-02-2022-0053

Kalteh, H. O., Mortazavi, S. B., Mohammadi, E., & Salesi, M. (2021). The relationship between safety culture and safety climate and safety performance: A systematic review. *International Journal of Occupational Safety and Ergonomics*, *27*(1), 206-216. https://doi.org/10.1080/10803548.2018.1556976

Karatepe, O. M. (2013). High-performance work practices and hotel employee performance: The mediation of work engagement. *International Journal of Hospitality Management*, *32*, 132-140.

Kell, H. J., Rittmayer, A. D., Crook, A. E., & Motowidlo, S. J. (2010). Situational Content Moderates the Association Between the Big Five Personality Traits and Behavioral Effectiveness. *Human Performance*, *23*(3), 213-228. https://doi.org/10.1080/08959285.2010.488458

Kelly, D., & Efthymiou, M. (2019). An analysis of human factors in fifty controlled flight into terrain aviation accidents from 2007 to 2017. *Journal of Safety Research*, *69*, 155-165. https://doi.org/10.1016/j.jsr.2019.03.009

Khalili, A. (2012). The role of emotional intelligence in the workplace: A literature review. *International Journal of Management*, *29*(3), 355-370.

Kharoufah, H., Murray, J., Baxter, G., & Wild, G. (2018). A review of human factors causations in commercial air transport accidents and incidents: From to 2000–2016. *Progress in Aerospace Sciences*, *99*, 1-13.

KILIÇ, B. (2019). HFACS analysis for investigating human errors in flight training accidents. *Journal of Aviation*, *3*(1), 28-37.

Kim, S., & Kochanska, G. (2017). Relational antecedents and social implications of the emotion of empathy: Evidence from three studies. *Emotion*, *17*(6), 981.

Kim, T. Y., Cable, D. M., Kim, S. P., & Wang, J. (2009). Emotional competence and work performance: The mediating effect of proactivity and the moderating effect of job autonomy. *Journal of Organizational Behavior*, *30*(7), 983-1000. https://doi.org/10.1007/s10869-016-9469-2

King, J. M., & Blickensderfer, E. L. (2023). Human factors in general aviation weather. In *Human Factors in Aviation and Aerospace* (pp. 543-562). Elsevier. https://doi.org/10.1016/B978-0-12-420139-2.00017-4

Klein, C., Salas, E., Burke, C. S., Goodwin, G. F., Halpin, S. M., Diazgranados, D., & Badum, A. (2006). DOES TEAM TRAINING ENHANCE TEAM PROCESSES, PERFORMANCE, AND TEAM MEMBER AFFECTIVE OUTCOMES? A META-ANALYSIS. Academy of Management Proceedings,

Kleine, A. K., Rudolph, C. W., & Zacher, H. (2019). Thriving at work: A meta‐analysis. *Journal of Organizational Behavior*, *40*(9-10), 973-999. https://doi.org/10.1002/job.2375

Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford publications.

Kong, F. (2017). The validity of the Wong and Law Emotional Intelligence Scale in a Chinese sample: Tests of measurement invariance and latent mean differences across gender and age. *Personality and Individual Differences*, *116*, 29-31. https://doi.org/10.1016/j.paid.2017.04.025

Kopp, A., & Jekauc, D. (2018). The influence of emotional intelligence on performance in competitive sports: A meta-analytical investigation. *Sports*, *6*(4), 175. https://doi.org/10.3390/sports6040175

Kotsou, I., Mikolajczak, M., Heeren, A., Grégoire, J., & Leys, C. (2019). Improving emotional intelligence: A systematic review of existing work and future challenges. *Emotion Review*, *11*(2), 151-165. https://doi.org/10.1177/17540739177359

Kozuba, J. (2011). Impact of human factor on likelihood of aircraft accident. *Archives of Transport System Telematics*, *4*, 29-36.
Krén, H., & Séllei, B. (2021). The role of emotional intelligence in organizational performance. *Periodica Polytechnica Social and Management Sciences*, *29*(1), 1-9. https://doi.org/10.3311/PPso.15879
Kukah, A. S., Akomea-Frimpong, I., Jin, X., & Osei-Kyei, R. (2021). Emotional intelligence (EI) research in the construction industry: A review and future directions. *Engineering, Construction and Architectural Management*. https://doi.org/10.1108/ECAM-05-2021-0414
Kundi, Y. M., Hollet-Haudebert, S., & Peterson, J. (2021). Career adaptability, job crafting and subjective career success: The moderating roles of lone wolf personality and positive perfectionism. *Personnel Review*, *51*(3), 945-965. https://doi.org/10.1108/PR-04-2020-0260
Kvalheim, S. A., & Dahl, Ø. (2016). Safety compliance and safety climate: A repeated cross-sectional study in the oil and gas industry. *Journal of Safety Research*, *59*, 33-41. https://doi.org/10.1016/j.jsr.2016.10.006
LaPalme, M. L., Wang, W., Joseph, D. L., Saklofske, D. H., & Yan, G. (2016). Measurement equivalence of the Wong and Law Emotional Intelligence Scale across cultures: An item response theory approach. *Personality and Individual Differences*, *90*, 190-198.
Law, K. S., Wong, C.-S., Huang, G.-H., & Li, X. (2008). The effects of emotional intelligence on job performance and life satisfaction for the research and development scientists in China. *Asia Pacific Journal of Management*, *25*(1), 51-69. https://doi.org/10.1007/s10490-007-9062-3
Law, K. S., Wong, C. S., & Song, L. J. (2004). The construct and criterion validity of emotional intelligence and its potential utility for management studies. *Journal of Applied Psychology*, *89*(3), 483-496. https://doi.org/10.1037/0021-9010.89.3.483
Lee, W., Migliaccio, G. C., Lin, K.-Y., & Seto, E. Y. (2020). Workforce development: understanding task-level job demands-resources, burnout, and performance in unskilled construction workers. *Safety Science*, *123*, 104577. https://doi.org/10.1080/10803548.2021.1942657
Lerner, J. S., Li, Y., Valdesolo, P., & Kassam, K. S. (2015). Emotion and decision making. *Annual Review of Psychology*, *66*, 799-823. https://doi.org/10.1146/annurev-psych-010213-115043
Leung, M.-y., Chan, Y.-S., & Yuen, K.-W. (2010). Impacts of stressors and stress on the injury incidents of construction workers in Hong Kong. *Journal of Construction Engineering and Management*, *136*(10), 1093-1103. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000216
Li, G., Baker, S. P., Grabowski, J. G., & Rebok, G. W. (2001). Factors associated with pilot error in aviation crashes. *Aviation, Space, and Environmental Medicine*, *72*(1), 52-58.
Li, N., Bao, S., Naseem, S., Sarfraz, M., & Mohsin, M. (2021). Extending the association between leader-member exchange differentiation and safety performance: a moderated mediation model. *Psychology Research and Behavior Management*, *14*, 1603. https://doi.org/10.2147/PRBM.S335199
Li, Q., Li, B., Wang, N., Li, W., Lyu, Z., Zhu, Y., & Liu, W. (2021). Human-machine interaction efficiency factors in flight simulator training towards Chinese pilots. International Conference on Applied Human Factors and Ergonomics,
Lin, Y.-c., Chen, A. S.-y., & Song, Y.-c. (2012). Does your intelligence help to survive in a foreign jungle? The effects of cultural intelligence and emotional intelligence on cross-cultural adjustment. *International Journal of Intercultural Relations*, *36*(4), 541-552. https://doi.org/10.1016/j.ijintrel.2012.03.001

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*, *9*(2), 151-173. https://doi.org/10.1207/S15328007SEM0902_1

Little, T. D., Jorgensen, T. D., Lang, K. M., & Moore, E. W. G. (2014). On the joys of missing data. *Journal of Pediatric Psychology*, *39*(2), 151-162. https://doi.org/10.1093/jpepsy/jst048

Liu, B., Xin, X., Ji, M., Yang, S., You, X., & Li, Y. (2023). Can family-work conflict influence safety behavior in airline pilots? The mediating role of fatigue and the moderating role of extraversion. *Safety Science*, *160*, 106061.

Liu, D., Gong, Y., Zhou, J., & Huang, J.-C. (2017). Human resource systems, employee creativity, and firm innovation: The moderating role of firm ownership. *Academy of Management Journal*, *60*(3), 1164-1188.

Loewenstein, G., & Lerner, J. S. (2003). The role of affect in decision making. *Handbook of Affective Science (pp . 619 -642). Oxford University Press.*, *619*(642), 619 - 642.

Lopes, P. N., Grewal, D., Kadis, J., Gall, M., & Salovey, P. (2006). Evidence that emotional intelligence is related to job performance and affect and attitudes at work. *Psicothema*, *18*(1), 132-138.

Lopes, P. N., Salovey, P., & Straus, R. (2003). Emotional intelligence, personality, and the perceived quality of social relationships. *Personality and Individual Differences*, *35*(3), 641-658.

Luo, X., Li, H., Dai, F., Cao, D., Yang, X., & Guo, H. (2017). Hierarchical Bayesian model of worker response to proximity warnings of construction safety hazards: Toward constant review of safety risk control measures. *Journal of Construction Engineering and Management*, *143*(6), 04017006.

Lyu, T., Song, W., & Du, K. (2019). Human factors analysis of air traffic safety based on HFACS-BN model. *Applied Sciences*, *9*(23), 5049.

MacCann, C., Jiang, Y., Brown, L. E., Double, K. S., Bucich, M., & Minbashian, A. (2020). Emotional intelligence predicts academic performance: A meta-analysis. *Psychological bulletin*, *146*(2), 150.

Maguire, R., Egan, A., Hyland, P., & Maguire, P. (2017). Engaging students emotionally: The role of emotional intelligence in predicting cognitive and affective engagement in higher education. *Higher Education Research & Development*, *36*(2), 343-357.

Man, S. S., Chan, A. H. S., Alabdulkarim, S., & Zhang, T. (2021). The effect of personal and organizational factors on the risk-taking behavior of Hong Kong construction workers. *Safety Science*, *136*, 105155. https://doi.org/10.1016/j.ssci.2020.105155

Masi, G., Amprimo, G., Ferraris, C., & Priano, L. (2023). Stress and workload assessment in aviation—a narrative review. *Sensors*, *23*(7), 3556.

Matthews, G., Emo, A. K., Funke, G., Zeidner, M., Roberts, R. D., Costa Jr, P. T., & Schulze, R. (2006). Emotional intelligence, personality, and task-induced stress. *Journal of Experimental Psychology: Applied*, *12*(2), 96. https://doi.org/10.1037/1076-898X.12.2.96

Matthews, G., Zeidner, M., & Roberts, R. D. (2004). *Emotional intelligence: Science and myth*. MIT press.

Mattingly, V., & Kraiger, K. (2019). Can emotional intelligence be trained? A meta-analytical investigation. *Human Resource Management Review*, *29*(2), 140-155. https://doi.org/10.1016/J.HRMR.2018.03.002

Mauno, S., Kinnunen, U., & Ruokolainen, M. (2007). Job demands and resources as antecedents of work engagement: A longitudinal study. *Journal of Vocational Behavior*, *70*(1), 149-171. https://doi.org/10.1016/j.jvb.2006.09.002

Mavin, T., & Dall'Alba, G. (2010). A model for integrating technical skills and NTS in assessing pilots' performance. 9th International Symposium of the Australian Aviation Psychology Association,

Mayer, J. D. (2002). *Mayer-Salovey-Caruso Emotional Entelligence Test (MSCEIT): User's Manual*. Toronto, Ontario: MHS Assessments.

Mayer, J. D., Caruso, D. R., & Salovey, P. (1999). Emotional Intelligence Meets Traditional Standards for an Intelligence. *Intelligence*, *27*(4), 267-298. https://doi.org/10.1016/S0160-2896(99)00016-1

Mayer, J. D., Caruso, D. R., & Salovey, P. (2016). The Ability Model of Emotional Intelligence: Principles and Updates. *Emotion Review*, *8*(4), 290-300. https://doi.org/10.1177/1754073916639667

Mayer, J. D., DiPaolo, M., & Salovey, P. (1990). Perceiving Affective Content in Ambiguous Visual Stimuli: A Component of Emotional Intelligence. *Journal of Personality Assessment*, *54*(3-4), 772-781. https://doi.org/10.1080/00223891.1990.9674037

Mayer, J. D., & Geher, G. (1996). Emotional Intelligence and the Identification of Emotion. *Intelligence*, *22*(2), 89-113. https://doi.org/10.1016/S0160-2896(96)90011-2

Mayer, J. D., Roberts, R. D., & Barsade, S. G. (2008a). Human Abilities: Emotional Intelligence. *The Annual Review of Psychology*, *59*, 507-536. https://doi.org/10.1146/annurev.psych.59.103006.093646

Mayer, J. D., & Salovey, P. (1995). Emotional intelligence and the construction and regulation of feelings. *Applied and Preventive Psychology*, *4*(3), 197-208. https://doi.org/10.1016/S0962-1849(05)80058-7

Mayer, J. D., & Salovey, P. (1997a). *Emotional development and emotional intelligence: Educational implications*. Basic Books.

Mayer, J. D., & Salovey, P. (1997b). What Is Emotional Intelligence? . In P. S. D. Sluyter (Ed.), *Emotional Development and Emotional Intelligence: Implications for Educators* (pp. 3-31). New York: Basic Books.

Mayer, J. D., Salovey, P., & Caruso, D. (1997). *Emotional IQ test (CD ROM)*, Needham, MA: Virtual Knowledge.

Mayer, J. D., Salovey, P., & Caruso, D. R. (2000). Emotional Intelligence as Zeitgeist, as Personality, and as a Mental Ability. In R. B.-O. J. D. A. Parker (Ed.), *The Handbook of Emotional Intelligence* (pp. 92-117). New York: Jossey-Bass.

Mayer, J. D., Salovey, P., & Caruso, D. R. (2004). TARGET ARTICLES:" Emotional Intelligence: Theory, Findings, and Implications". *Psychological Inquiry*, *15*(3), 197-215. https://doi.org/10.1207/s15327965pli1503_02

Mayer, J. D., Salovey, P., & Caruso, D. R. (2008). Emotional intelligence: New ability or eclectic traits? *American Psychologist*, *63*(6), 503-517. https://doi.org/10.1037/0003-066X.63.6.503

Mayer, J. D., Salovey, P., & Caruso, D. R. (2008b). Emotional intelligence: New Ability or Eclectic Traits? *American Psychologist*, *63*(6), 503-517. https://doi.org/10.1037/0003-066X.63.6.503

Mayer, J. D., Salovey, P., Caruso, D. R., & Cherkasskiy, L. (2011). Emotional Intelligence. In *The Cambridge Handbook of Intelligence (pp. 528-549)* Cambridge University Press. https://doi.org/10.1017/CBO9780511977244.027

Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2001). Emotional Intelligence as a Standard Intelligence. *American Psychologist*. https://doi.org/0.1037/1528-3542.1.3.232

McCusker, K., & Gunaydin, S. (2015). Research using qualitative, quantitative or mixed methods and choice based on the research. *Perfusion*, *30*(7), 537-542. https://doi.org/10.1177/0267659114559116

Meisler, G., & Vigoda-Gadot, E. (2014). Perceived organizational politics, emotional intelligence and work outcomes. *Personnel Review*, *43*(1), 116-135. https://doi.org/10.1108/pr-02-2012-0040

Memon, M. A., Salleh, R., & Baharom, M. N. R. (2016). The link between training satisfaction, work engagement and turnover intention. *European Journal of Training and Development*.

Miao, C., Humphrey, R. H., & Qian, S. (2017). A meta‐analysis of emotional intelligence and work attitudes. *Journal of Occupational and Organizational Psychology*, *90*(2), 177-202. https://doi.org/10.1111/JOOP.12167

Miao, C., Humphrey, R. H., & Qian, S. (2021). Emotional intelligence and job performance in the hospitality industry: a meta-analytic review. *International Journal of Contemporary Hospitality Management*. https://doi.org/10.1108/IJCHM-04-2020-0323

Mikolajczak, M., & Luminet, O. (2008). Trait emotional intelligence and the cognitive appraisal of stressful events: An exploratory study. *Personality and Individual Differences*, *44*(7), 1445-1453. https://doi.org/10.1016/j.paid.2007.12.012

Millán, J. M., Hessels, J., Thurik, R., & Aguado, R. (2011). Determinants of job satisfaction: a European comparison of self-employed and paid employees. *Small Business Economics*, *40*(3), 651-670. https://doi.org/10.1007/s11187-011-9380-1

Miner, A. G., & Glomb, T. M. (2010). State mood, task performance, and behavior at work: A within-persons approach. *Organizational Behavior and Human Decision Processes*, *112*(1), 43-57. https://doi.org/10.1016/j.obhdp.2009.11.009

Mohammadfam, I., Mahdinia, M., Soltanzadeh, A., Aliabadi, M. M., & Soltanian, A. R. (2021). A path analysis model of individual variables predicting safety behavior and human error: The mediating effect of situation awareness. *International Journal of Industrial Ergonomics*, *84*, 103144. https://doi.org/10.1016/j.ergon.2021.103144

Motowidlo, S. J., Borman, W. C., & Schmit, M. J. (2014). A theory of individual differences in task and contextual performance. In *Organizational Citizenship Behavior and Contextual Performance* (pp. 71-83). Psychology Press.

Mount, M. K., Barrick, M. R., & Stewart, G. L. (1998). Five-factor model of personality and performance in jobs involving interpersonal interactions. *Human Performance*, *11*(2-3), 145-165. https://doi.org/10.1080/08959285.1998.9668029

Muchinsky, P. M. (2000). Emotions in the workplace: The neglect of organizational behavior. *Journal of Organizational Behavior*, *21*(7), 801-805. https://doi.org/10.1002/1099-1379(200011)21:7<801::AID-JOB999>3.0.CO;2-A

Nahrgang, J. D., Morgeson, F. P., & Hofmann, D. A. (2011). Safety at work: a meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. In: American Psychological Association.

Nardi, P. M. (2018). *Doing survey research: A guide to quantitative methods*. Routledge.

Nawaz, M., Abid, G., Arya, B., Bhatti, G. A., & Farooqi, S. (2020). Understanding employee thriving: The role of workplace context, personality and individual resources. *Total Quality Management & Business Excellence*, *31*(11-12), 1345-1362.

Nazir, S., Colombo, S., & Manca, D. (2012). The role of situation awareness for the operators of process industry. *Chemical Engineering Transactions*, *26*, 303-308. https://doi.org/10.3303/CET1226051

Neal, A., & Griffin, M. A. (1999). Developing a model of individual performance for human resource management. *Asia Pacific Journal of Human Resources*, *37*(2), 44-59.

Neal, A., & Griffin, M. A. (2002). Safety climate and safety behaviour. *Australian Journal of Management*, *27*(1 suppl), 67-75. https://doi.org/10.1177/031289620202701S08

Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels.

Journal of Applied Psychology, *91*(4), 946-953. https://doi.org/10.1037/0021-9010.91.4.946

Neal, A., Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behavior. *Safety Science*, *34*(1-3), 99-109. https://doi.org/10.1016/s0925-7535(00)00008-4

Nembhard, D. A. (2007). *Workforce cross training*. CRC Press.

Newman, D. A., Joseph, D. L., & MacCann, C. (2010). Emotional intelligence and job performance: The importance of emotion regulation and emotional labor context. *Industrial and Organizational Psychology*, *3*(2), 159-164.

News, J. (2019). *Disputes, Lawsuits, and Exorbitant Compensation Claims: Why Is It So Difficult for Pilots to Resign?* https://m.huxiu.com/article/311014.html

Newsome, S., Day, A. L., & Catano, V. M. (2000). Assessing the predictive validity of emotional intelligence. *Personality and Individual Differences*, *29*(6), 1005-1016. https://doi.org/10.1016/s0191-8869(99)00250-0

Nielsen, K., Nielsen, M. B., Ogbonnaya, C., Känsälä, M., Saari, E., & Isaksson, K. (2017). Workplace resources to improve both employee well-being and performance: A systematic review and meta-analysis. *Work & Stress*, *31*(2), 101-120.

Nikolaou, I., & Tsaousis, I. (2002). Emotional intelligence in the workplace: Exploring its effects on occupational stress and organizational commitment. *The International Journal of Organizational Analysis*, *10*(4), 327-342. https://doi.org/10.1108/eb028956

O'Boyle, E. H., Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance: A meta-analysis. *Journal of Organizational Behavior*, *32*(5), 788-818. https://doi.org/10.1002/job.714

O'Boyle, E. H., Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance: A meta-analysis. *Journal of Organizational Behavior*, *32*(5), 788-818. https://doi.org/10.1002/job.714

O'Boyle Jr, E. H., Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance: A meta-analysis. *Journal of Organizational Behavior*, *32*(5), 788-818. https://doi.org/10.1002/job.714

O'Connor, P. J., Hill, A., Kaya, M., & Martin, B. (2019). The measurement of emotional intelligence: A critical review of the literature and recommendations for researchers and practitioners. *Frontiers in Psychology*, *10*, 1116.

Ocampo, A. C. G., Restubog, S. L. D., Liwag, M. E., Wang, L., & Petelczyc, C. (2018). My spouse is my strength: Interactive effects of perceived organizational and spousal support in predicting career adaptability and career outcomes. *Journal of Vocational Behavior*, *108*, 165-177. https://doi.org/10.1016/j.jvb.2018.08.001

Ochoa Pacheco, P., Coello-Montecel, D., & Andrei, D. M. (2023). Validation of the Spanish version of the Neal, Griffin and Hart safety behavior scale. *International Journal of Occupational Safety and Ergonomics*, *29*(4), 1402-1415.

Ohme, M., & Zacher, H. (2015). Job performance ratings: The relative importance of mental ability, conscientiousness, and career adaptability. *Journal of Vocational Behavior*, *87*, 161-170. https://doi.org/10.1016/j.jvb.2015.01.003

Olawoyin, R. (2018). Emotional intelligence: Assessing its importance in safety leadership. *Professional Safety*, *63*(08), 41-47.

Organization, I. C. A. (2023). *Safety Report*. C. Published in Montréal. www.icao.int

Pacheco, N. E., Rey, L., & Sánchez-Álvarez, N. (2019). Validation of the Spanish version of the Wong Law emotional intelligence scale (WLEIS-S). *Psicothema*, *31*(1), 94-100.

Parmentier, M., Pirsoul, T., & Nils, F. (2019). Examining the impact of emotional intelligence on career adaptability: A two-wave cross-lagged study. *Personality and Individual Differences*, *151*, 109446.

Paterson, T. A., Luthans, F., & Jeung, W. (2014). Thriving at work: Impact of psychological capital and supervisor support. *Journal of Organizational Behavior*, *35*(3), 434-446. https://doi.org/10.1002/job.1907

Paul, S., Patterson, S., & Varela, C. A. (2020). Collaborative situational awareness for conflict-aware flight planning. 2020 AIAA/IEEE 39th Digital Avionics Systems Conference (DASC),

Petrides, K., & Furnham, A. (2000). Gender differences in measured and self-estimated trait emotional intelligence. *Sex Roles*, *42*(5-6), 449-461.

Petrides, K. V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology*, *98*(2), 273-289. https://doi.org/10.1348/000712606X120618

Porath, C., Spreitzer, G., Gibson, C., & Garnett, F. G. (2012). Thriving at work: Toward its measurement, construct validation, and theoretical refinement. *Journal of Organizational Behavior*, *33*(2), 250-275. https://doi.org/10.1002/job.756

Puffer, K. A., Pence, K. G., & Ferry, A. E. (2021). A Feasibility Study on an Ultra-Brief Intervention for Improving Freshmen's Emotional Intelligence. *Journal of Intelligence*, *9*(3), 36. https://doi.org/10.3390/jintelligence9030036

Qualter, P., Gardner, K. J., Pope, D. J., Hutchinson, J. M., & Whiteley, H. E. (2012). Ability emotional intelligence, trait emotional intelligence, and academic success in British secondary schools: A 5 year longitudinal study. *Learning and Individual Differences*, *22*(1), 83-91. https://doi.org/10.1016/j.lindif.2011.11.007

Rahman, M. S. (2020). The advantages and disadvantages of using qualitative and quantitative approaches and methods in language "testing and assessment" research: A literature review. https://doi.org/10.5539/jel.v6n1p102

Ran, J., Liu, H., Yuan, Y., Yu, X., & Dong, T. (2023). Linking career exploration, self-reflection, career calling, career adaptability and subjective well-being: A self-regulation theory perspective. *Psychology Research and Behavior Management*, 2805-2817.

Rasheed, M. I., Okumus, F., Weng, Q., Hameed, Z., & Nawaz, M. S. (2020). Career adaptability and employee turnover intentions: The role of perceived career opportunities and orientation to happiness in the hospitality industry. *Journal of Hospitality and Tourism Management*, *44*, 98-107. https://doi.org/10.1016/j.jhtm.2020.05.006

Ravichandran, K., Arasu, R., & Kumar, S. A. (2011). The impact of emotional intelligence on employee work engagement behavior: An empirical study. *International Journal of Business and Management*, *6*(11), 157.

Restubog, S. L. D., Ocampo, A. C. G., & Wang, L. (2020). Taking control amidst the chaos: Emotion regulation during the COVID-19 pandemic. *Journal of Vocational Behavior*, *119*, 103440. https://doi.org/10.1016/j.jvb.2020.103440

Rhee, S.-Y., Hur, W.-M., & Kim, M. (2017). The relationship of coworker incivility to job performance and the moderating role of self-efficacy and compassion at work: The Job Demands-Resources (JD-R) Approach. *Journal of Business and Psychology*, *32*(6), 711-726. https://doi.org/10.1007/s10869-016-9469-2

Rode, J. C., Mooney, C. H., Arthaud-Day, M. L., Near, J. P., Baldwin, T. T., Rubin, R. S., & Bommer, W. H. (2007). Emotional intelligence and individual performance: Evidence of direct and moderated effects. *Journal of Organizational Behavior*, *28*(4), 399-421. https://doi.org/10.1002/job.429

Rothbard, N. P., & Wilk, S. L. (2011). Waking up on the right or wrong side of the bed: Start-of-workday mood, work events, employee affect, and performance. *Academy of Management Journal*, *54*(5), 959-980. https://doi.org/10.5465/amj.2007.0056

Rudolph, C. W., Lavigne, K. N., Katz, I. M., & Zacher, H. (2017). Linking dimensions of career adaptability to adaptation results: A meta-analysis. *Journal of Vocational Behavior*.

Sadovyy, M., Sánchez-Gómez, M., & Bresó, E. (2021). COVID-19: How the stress generated by the pandemic may affect work performance through the moderating role of emotional intelligence. *Personality and Individual Differences*, *180*, 110986. https://doi.org/10.1016/j.paid.2021.110986

Sætrevik, B. (2013). Developing a context-general self-report approach to measure three-level situation awareness. *International Maritime Health*, *64*(2), 66-71.

Sætrevik, B., & Hystad, S. W. (2017). Situation awareness as a determinant for unsafe actions and subjective risk assessment on offshore attendant vessels. *Safety Science*, *93*, 214-221.

Sætrevik, B., & Hystad, S. W. (2021). Ship leadership, situation awareness, and crew safety behaviour—preregistered replications in two survey datasets.

Saklofske, D. H., Austin, E. J., Mastoras, S. M., Beaton, L., & Osborne, S. E. (2012). Relationships of personality, affect, emotional intelligence and coping with student stress and academic success: Different patterns of association for stress and success. *Learning and Individual Differences*, *22*(2), 251-257. https://doi.org/10.1016/j.lindif.2011.02.010

Sala, F. (2002). Emotional competence inventory: Technical manual. *Philadelphia, PA: McClelland Center For Research, HayGroup*.

Salminen, M., Hamari, J., & Ravaja, N. (2021). Empathizing with the End User: Effect of Empathy and Emotional Intelligence on Ideation. *Creativity Research Journal*, *33*(2), 191-201. https://doi.org/10400419.2020.1864164

Salmon, P. M., Walker, G. H., & Stanton, N. A. (2016). Pilot error versus sociotechnical systems failure: a distributed situation awareness analysis of Air France 447. *Theoretical Issues in Ergonomics Science*, *17*(1), 64-79.

Salovey, P., & Grewal, D. (2005). The science of emotional intelligence. *Current directions in psychological science*, *14*(6), 281-285.

Salovey, P., & Mayer, J. D. (1990). Emotional Intelligence. *Imagination, Cognition and Personality*, *9*(3), 185-211. https://doi.org/10.2190/DUGG-P24E-52WK-6CDG

Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & Palfai, T. P. (1995). Emotional attention, clarity, and repair: Exploring emotional intelligence using the Trait Meta-Mood Scale. In J. W. Pennebaker (Ed.), *Emotion, Disclosure, and Health* (pp. 125-154). Washington, D.C.: American Psychologica.

Salvendy, G. (2012). *Handbook of human factors and ergonomics*. John Wiley & Sons.

Sánchez-Álvarez, N., Extremera, N., & Fernández-Berrocal, P. (2016). The relation between emotional intelligence and subjective well-being: A meta-analytic investigation. *The Journal of Positive Psychology*, *11*(3), 276-285. https://doi.org/10.1080/17439760.2015.1058968

Sanchez-Ruiz, M.-J., Mavroveli, S., & Poullis, J. (2013). Trait emotional intelligence and its links to university performance: An examination. *Personality and Individual Differences*, *54*(5), 658-662. https://doi.org/10.1016/j.paid.2012.11.013

Savickas, M. L. (1997). Career adaptability: An integrative construct for life-span, life-space theory. *The Career Development Quarterly*, *45*(3), 247-259. https://doi.org/10.1002/j.2161-0045.1997.tb00469

Savickas, M. L. (2002). *Career construction: A developmental theory of vocational behavior.* (D. Brown, Ed.). Jossey-Bass.

Savickas, M. L. (2005). *The theory and practice of career construction* (Vol. 1).

Savickas, M. L. (2013). *Career construction theory and practice* (S. D. B. R. W. Lent, Ed. Vol. 2). Wiley. .

Savickas, M. L., & Porfeli, E. J. (2012). Career Adapt-Abilities Scale: Construction, reliability, and measurement equivalence across 13 countries. *Journal of Vocational Behavior*, *80*(3), 661-673. https://doi.org/10.1016/j.jvb.2012.01.011

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of psychological research online*, *8*(2), 23-74.

Schneider, T. R., Lyons, J. B., & Khazon, S. (2013). Emotional intelligence and resilience. *Personality and Individual Differences*, *55*(8), 909-914. https://doi.org/10.1016/j.paid.2013.07.460

Schriesheim, J. F. (1980). The social context of leader–subordinate relations: An investigation of the effects of group cohesiveness. *Journal of Applied Psychology*, *65*(2), 183-194. https://doi.org/10.1037/0021-9010.65.2.183

Schutte, N. S., & Loi, N. M. (2014). Connections between emotional intelligence and workplace flourishing. *Personality and Individual Differences*, *66*, 134-139. https://doi.org/10.1016/j.paid.2014.03.031

Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, *25*(2), 167-177. https://doi.org/10.1016/s0191-8869(98)00001-4

Schutte, N. S., Malouff, J. M., Price, I., Walter, S., Burke, G., & Wilkinson, C. (2008). Person–situation interaction in adaptive emotional functioning. *Current Psychology*, *27*(2), 102-111. https://doi.org/10.1007/s12144-008-9027-9

Sears, G. J., & Holmvall, C. M. (2010). The joint influence of supervisor and subordinate emotional intelligence on leader–member exchange. *Journal of Business and Psychology*, *25*(4), 593-605.

Shappell, S. A., & Wiegmann, D. A. (2000). The human factors analysis and classification system--HFACS. *Journal of Purdue Undergraduate Research*(10), 69 - 77. https://doi.org/10.7771/2158-4052.1485

Shepherd, R., Lorente, L., Vignoli, M., Nielsen, K., & Peiró, J. M. (2021). Challenges influencing the safety of migrant workers in the construction industry: A qualitative study in Italy, Spain, and the UK. *Safety Science*, *142*, 105388. https://doi.org/10.1016/j.ssci.2021.105388

Shi, Y. (2022). Labour protection and civil pilots in China: Training cost in the legal swamp. *Air and Space Law*, *47*(4/5).

Shuck, B., Twyford, D., Reio Jr, T. G., & Shuck, A. (2014). Human resource development practices and employee engagement: Examining the connection with employee turnover intentions. *Human Resource Development Quarterly*, *25*(2), 239-270.

Sieben, I. (2007). Does training trigger turnover-or not? The impact of formal training on graduates' job search behaviour. *Work, Employment and Society*, *21*(3), 397-416.

Siu, O.-L., Phillips, D. R., & Leung, T.-W. (2003). Age differences in safety attitudes and safety performance in Hong Kong construction workers. *Journal of Safety Research*, *34*(2), 199-205. https://doi.org/10.1016/S0022-4375(02)00072-5

Small, A. (2020). Human factors analysis and classification system (HFACS): As applied to Asiana Airlines Flight 214. *The Journal of Purdue Undergraduate Research*, *10*(1), 18.

Smith, K., & Hancock, P. A. (1995). Situation awareness is adaptive, externally directed consciousness. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, *37*(1), 137-148.

Sneddon, A., Mearns, K., & Flin, R. (2013). Stress, fatigue, situation awareness and safety in offshore drilling crews. *Safety Science*, *56*, 80-88. https://doi.org/10.1016/j.ssci.2012.05.027

Sorensen, G., Dennerlein, J. T., Peters, S. E., Sabbath, E. L., Kelly, E. L., & Wagner, G. R. (2021). The future of research on work, safety, health and wellbeing: A guiding conceptual framework. *Social Science & Medicine*, *269*, 113593. https://doi.org/10.1016/j.socscimed.2020.113593

Sousa, V. D., & Rojjanasrirat, W. (2011). Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *Journal of Evaluation in Clinical Practice*, *17*(2), 268-274. https://doi.org/10.1111/j.1365-2753.2010.01434.x

Spreitzer, G., Porath, C. L., & Gibson, C. B. (2012). Toward human sustainability: How to enable more thriving at work. *Organizational Dynamics*, *41*(2), 155-162. https://doi.org/doi:10.1016/j.orgdyn.2012.01.009

Spreitzer, G., Sutcliffe, K., Dutton, J., Sonenshein, S., & Grant, A. M. (2004). Enabling thriving at work: A process model of human growth in organizations. *Organization Science*.

Spreitzer, G., Sutcliffe, K., Dutton, J., Sonenshein, S., & Grant, A. M. (2005). A socially embedded model of thriving at work. *Organization Science*, *16*(5), 537-549. https://doi.org/10.1287/orsc.1050.0153

Spreitzer, G. M., & Porath, C. (2014). Self-determination as nutriment for thriving: Building an integrative model of human growth at work. In M. Gagné (Ed.), *The Oxford handbook of work engagement, motivation, and self-determination theory* (pp. 245-258). Oxford University Press.

Spreitzer, G. M., & Sutcliffe, K. M. (2007). *Thriving in organizations*. SAGE Publications Ltd.

Stanton, N. A., Chambers, P. R., & Piggott, J. (2001). Situational awareness and safety. *Safety Science*, *39*(3), 189-204.

Stanton, N. A., Stewart, R., Harris, D., Houghton, R. J., Baber, C., McMaster, R., Salmon, P., Hoyle, G., Walker, G., & Young, M. S. (2006). Distributed situation awareness in dynamic systems: theoretical development and application of an ergonomics methodology. *Ergonomics*, *49*(12-13), 1288-1311.

Statista. (2023). *Number of flights performed by the global airline industry from 2004 to 2022*. Statista Research Department.

Sternberg, R. J. (2020). *The cambridge handbook of intelligence*. Cambridge University Press.

Stiles, P., & Kulvisaechana, S. (2003). *Human capital and performance: A literature review*. DTI.

Stolzer, A. J., Halford, C. D., & Goglia, J. J. (2016). *Implementing Safety Management Systems in Aviation*. Ashgate Publishing, Ltd.

Subramony, M., Krause, N., Norton, J., & Burns, G. N. (2008). The relationship between human resource investments and organizational performance: A firm-level examination of equilibrium theory. *Journal of Applied Psychology*, *93*(4), 778.

Sung, S. Y., Du, J., & Choi, J. N. (2018). Cognitive pathways of team climate for creativity: Implications for member creativity and job performance. *Human Performance*, *31*(4), 197-215.

Sunindijo, R. Y., & Zou, P. X. (2013). The roles of emotional intelligence, interpersonal skill, and transformational leadership on improving construction safety performance. *Construction Economics and Building*, *13*(3), 97-113. https://doi.org/doi.org/10.1016/j.aap.2011.07.021

Sunindijo, Y., & Zou, P. X. (2012). The influence of project personnel's emotional intelligence, interpersonal skill, and transformational leadership on construction safety climate

development. *International Journal of Project Organisation and Management*, *5*(1), 1-13.
Sy, T., Tram, S., & O'Hara, L. A. (2006). Relation of employee and manager emotional intelligence to job satisfaction and performance. *Journal of Vocational Behavior*, *68*(3), 461-473. https://doi.org/10.1016/j.jvb.2005.10.003
Syed-Yahya, S. N., Idris, M. A., & Noblet, A. J. (2022). The relationship between safety climate and safety performance: A review. *Journal of Safety Research*. https://doi.org/10.1016/j.jsr.2022.08.008
Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, *48*, 1273-1296. https://doi.org/10.1007/s11165-016-9602-2
Takala, J., Hämäläinen, P., Saarela, K. L., Yun, L. Y., Manickam, K., Jin, T. W., Heng, P., Tjong, C., Kheng, L. G., & Lim, S. (2014). Global estimates of the burden of injury and illness at work in 2012. *Journal of Occupational and Environmental Hygiene*, *11*(5), 326-337.
Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology*, *88*(3), 500-517. https://doi.org/10.1037/0021-9010.88.3.500
Tett, R. P., Toich, M. J., & Ozkum, S. B. (2021). Trait activation theory: A review of the literature and applications to five lines of personality dynamics research. *Annual Review of Organizational Psychology and Organizational Behavior*, *8*, 199-233. https://doi.org/10.1146/annurev-orgpsych-012420-062228
Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, *59*(2-3), 25-52.
Timmis, A. (2020). Aircraft manufacturing and technology. In *Air Transport Management* (pp. 271-286). Routledge. https://doi.org/10.4324/9780429299445
Trevarthen, C. (1977). Cognition and reality: principles and implications of cognitive psychology. In: SAGE Publications Sage UK: London, England.
Trigueros, R., Padilla, A. M., Aguilar-Parra, J. M., Rocamora, P., Morales-Gázquez, M. J., & López-Liria, R. (2020). The influence of emotional intelligence on resilience, test anxiety, academic stress and the mediterranean diet. A study with university students. *International Journal of Environmental Research and Public Health*, *17*(6), 2071. https://doi.org/10.3390/ijerph17062071
Tu, C., Guo, J., Hatcher, R. C., & Kaufman, J. C. (2018). The relationship between emotional intelligence and domain-specific and domain-general creativity. *The Journal of Creative Behavior*, *54*(2), 337-349. https://doi.org/10.1002/jocb.369
Tuli, F. (2010). The basis of distinction between qualitative and quantitative research in social science: Reflection on ontological, epistemological and methodological perspectives. *Ethiopian Journal of Education and Sciences*, *6*(1). https://doi.org/10.5539/jel.v6n1p102
Turner, N., Stride, C. B., Carter, A. J., McCaughey, D., & Carroll, A. E. (2012). Job Demands–Control–Support model and employee safety performance. *Accident Analysis & Prevention*, *45*, 811-817. https://doi.org/10.1016/j.aap.2011.07.005
Udayar, S., Fiori, M., & Bausseron, E. (2020). Emotional intelligence and performance in a stressful task: The mediating role of self-efficacy. *Personality and Individual Differences*, *156*, 109 - 790. https://doi.org/10.1016/j.paid.2019.109790
Usman, M., Liu, Y., Li, H., Zhang, J., Ghani, U., & Gul, H. (2020). Enabling the engine of workplace thriving through servant leadership: The moderating role of core self-evaluations. *Journal of Management & Organization ,*, *27*(3), 582-600. https://doi.org/10.1017/jmo.2020.11

Valeri, L., & VanderWeele, T. J. (2013). Mediation analysis allowing for exposure–mediator interactions and causal interpretation: Theoretical assumptions and implementation with SAS and SPSS macros. *Psychological Methods*, *18*(2), 137. https://doi.org/10.1037/a0031034

Vallès-Català, T., Pedret, A., Ribes, D., Medina, D., & Traveria, M. (2021). Effects of stress on performance during highly demanding tasks in student pilots. *The International Journal of Aerospace Psychology*, *31*(1), 43-55.

Van de Mortel, T. F. (2008). Faking it: social desirability response bias in self-report research. *Australian Journal of Advanced Nursing, The*, *25*(4), 40-48.

van der Walt, F. (2018). Workplace spirituality, work engagement and thriving at work. *SA Journal of Industrial Psychology*, *44*(1), 1-10.

Van Rooy, D. L., & Viswesvaran, C. (2004). Emotional intelligence: A meta-analytic investigation of predictive validity and nomological net. *Journal of Vocational Behavior*, *65*(1), 71-95. https://doi.org/10.1016/S0001-8791(03)00076-9

Van Winsen, R., Henriqson, E., Schuler, B., & Dekker, S. W. (2015). Situation awareness: Some conditions of possibility. *Theoretical Issues in Ergonomics Science*, *16*(1), 53-68. https://doi.org/10.1080/1463922X.2014.880529

Wallace, J. C., Butts, M. M., Johnson, P. D., Stevens, F. G., & Smith, M. B. (2016). A multilevel model of employee innovation: Understanding the effects of regulatory focus, thriving, and employee involvement climate. *Journal of Management*, *42*(4), 982-1004. https://doi.org/10.1177/0149206313506462

Walsh, G., & Bartikowski, B. (2013). Exploring corporate ability and social responsibility associations as antecedents of customer satisfaction cross-culturally. *Journal of Business Research*, *66*(8), 989-995.

Walumbwa, F. O., Christensen-Salem, A., Perrmann-Graham, J., & Kasimu, P. (2020). An identification based framework examining how and when salient social exchange resources facilitate and shape thriving at work. *Human Resource Development Review*, *19*(4), 339-361. https://doi.org/10.1177/153448432094620

Walumbwa, F. O., Muchiri, M. K., Misati, E., Wu, C., & Meiliani, M. (2018). Inspired to perform: A multilevel investigation of antecedents and consequences of thriving at work. *Journal of Organizational Behavior*, *39*(3), 249-261. https://doi.org/10.1002/job.2216

Wang, J., Zou, P. X., & Li, P. P. (2016). Critical factors and paths influencing construction workers' safety risk tolerances. *Accident Analysis & Prevention*, *93*, 267-279. https://doi.org/10.1016/j.aap.2015.11.027

Wang, Y., & Zhang, C. (2019). Situation Awareness in Smart Grids. In X. Shen, X. Lin, & K. Zhang (Eds.), *Encyclopedia of Wireless Networks* (pp. 1-5). Springer International Publishing. https://doi.org/10.1007/978-3-319-32903-1_343-1

Wang, Z., Jiang, Z., & Blackman, A. (2021). Linking emotional intelligence to safety performance: The roles of situational awareness and safety training. *Journal of Safety Research*.

Waycaster, G. C., Matsumura, T., Bilotkach, V., Haftka, R. T., & Kim, N. H. (2018). Review of regulatory emphasis on transportation safety in the United States, 2002–2009: Public versus private modes. *Risk Analysis*, *38*(5), 1085-1101.

Westaby, J. D., & Lowe, J. K. (2005). Risk-Taking Orientation and Injury Among Youth Workers: Examining the Social Influence of Supervisors, Coworkers, and Parents. *Journal of Applied Psychology*, *90*(5), 1027-1035. https://doi.org/10.1037/0021-9010.90.5.1027.

Wickens, C. D., & Carswell, C. M. (2021). Information processing. In *Handbook of human factors and ergonomics* (pp. 114-158).

Wiegand, D. M. (2007). Exploring the role of emotional intelligence in behavior-based safety coaching. *J Safety Res*, *38*(4), 391-398. https://doi.org/10.1016/j.jsr.2007.03.010
Wong, C.-S., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly*, *13*(3), 243-274. https://doi.org/10.1016/S1048-9843(02)00099-1
Wong, C.-S., Law, K. S., & Wong, P.-M. (2004). Development and validation of a forced choice emotional intelligence measure for Chinese respondents in Hong Kong. *Asia Pacific Journal of Management*, *21*(4), 535-559.
Wong, C.-S., Wong, P.-M., & Peng, K. Z. (2010). Effect of middle-level leader and teacher emotional intelligence on school teachers' job satisfaction: The case of Hong Kong. *Educational Management Administration & Leadership*, *38*(1), 59-70. https://doi.org/10.1177/1741143209351831
Wong, K. Y., & Aspinwall, E. (2004). Characterizing knowledge management in the small business environment. *Journal of Knowledge Management*. https://doi.org/10.1108/13673270410541033
Xia, N., Griffin, M. A., Wang, X., Liu, X., & Wang, D. (2018). Is there agreement between worker self and supervisor assessment of worker safety performance? An examination in the construction industry. *Journal of Safety Research*, *65*, 29-37. https://doi.org/10.1016/j.jsr.2018.03.001
Xia, N., Griffin, M. A., Xie, Q., & Hu, X. (2023). Antecedents of workplace safety behavior: Meta-analysis in the construction industry. *Journal of Construction Engineering and Management*, *149*(4), 04023009.
Xu, R., Luo, F., Chen, G., Zhou, F., & Abdulahi, E. W. (2021). Application of HFACS and grounded theory for identifying risk factors of air traffic controllers' unsafe acts. *International Journal of Industrial Ergonomics*, *86*, 103228. https://doi.org/10.1016/j.ergon.2021.103228
Xu, W., Bao, Y., Zhang, L., Li, Y., Zhang, E., Li, H., Jin, Q., Chen, Y., Duan, Q., & Shi, F. (2024). Challenges and support needs in psychological and physical health among pilots: a qualitative study. *Frontiers in Public Health*, *12*, 1351568.
Xu, X., Liu, W., & Pang, W. (2019). Are emotionally intelligent people more creative? A meta-analysis of the emotional intelligence–creativity link. *Sustainability*, *11*(21), 6123.
Xue, Y., & Fu, G. (2018). A modified accident analysis and investigation model for the general aviation industry: Emphasizing on human and organizational factors. *Journal of Safety Research*, *67*, 1-15.
Yap, J. B. H., & Lee, W. K. (2020). Analysing the underlying factors affecting safety performance in building construction. *Production Planning & Control*, *31*(13), 1061-1076. https://doi.org/10.1080/09537287.2019.1695292
Yorio, P. L., & Wachter, J. K. (2014). The impact of human performance focused safety and health management practices on injury and illness rates: Do size and industry matter? *Safety Science*, *62*, 157-167. https://doi.org/10.1016/j.ssci.2013.08.014
Young, J. A. (2008). The effects of life-stress on pilot performance. *National Aeronautics and Space Administration Ames Research Center, Moffett Field, California, US*.
Zacharatos, A., Barling, J., & Iverson, R. D. (2005). High-Performance Work Systems and Occupational Safety. *Journal of Applied Psychology*, *90*(1), 77-93. https://doi.org/10.1037/0021-9010.90.1.77
Zacher, H. (2014). Career adaptability predicts subjective career success above and beyond personality traits and core self-evaluations. *Journal of Vocational Behavior*, *84*(1), 21-30. https://doi.org/10.1016/j.jvb.2013.10.002

Zeidner, M., Matthews, G., & Roberts, R. D. (2004). Emotional intelligence in the workplace: A critical review. *Applied Psychology*, *53*(3), 371-399. https://doi.org/10.1111/j.1464-0597.2004.00176.x

Zhang, J., Bal, P. M., Akhtar, M. N., Long, L., Zhang, Y., & Ma, Z. (2019). High-performance work system and employee performance: the mediating roles of social exchange and thriving and the moderating effect of employee proactive personality. *Asia Pacific Journal of Human Resources*, *57*(3), 369-395. https://doi.org/10.1111/1744-7941.12199

Zhang, J., Ding, W., Li, Y., & Wu, C. (2013). Task complexity matters: The influence of trait mindfulness on task and safety performance of nuclear power plant operators. *Personality and Individual Differences*, *55*(4), 433-439. https://doi.org/10.1016/j.paid.2013.04.004

Zhang, J., Xie, C., & Morrison, A. M. (2021). The effect of corporate social responsibility on hotel employee safety behavior during COVID-19: The moderation of belief restoration and negative emotions. *Journal of Hospitality and Tourism Management*, *46*, 233-243. https://doi.org/10.1016/j.jhtm.2020.12.011

Zhao, S. H., Shi, Y., Sun, Z. N., Xie, F. Z., Wang, J. H., Zhang, S. E., Gou, T. Y., Han, X. Y., Sun, T., & Fan, L. H. (2018). Impact of workplace violence against nurses' thriving at work, job satisfaction and turnover intention: A cross-sectional study. *Journal of Clinical Nursing*, *27*(13-14), 2620-2632.

Zhou, F., Lu, H., & Jiang, C. (2024). Violation with concerns of safety: A study on non-compliant behavior and the antecedent and consequent effects in power grid construction. *Safety Science*, *170*, 106353.

Zhu, D., Doan, T., Kanjanakan, P., & Kim, P. B. (2022). The impact of emotional intelligence on hospitality employees' work outcomes: A systematic and meta-analytical review. *Journal of Hospitality Marketing & Management*, *31*(3), 326-347. https://doi.org/10.1080/19368623.2021.1978914

Zhu, F., Cai, Z., Buchtel, E. E., & Guan, Y. (2019). Career construction in social exchange: a dual-path model linking career adaptability to turnover intention. *Journal of Vocational Behavior*, *112*, 282-293.

Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and applied implications. *Journal of Applied Psychology*, *65*(1), 96-102. https://doi.org/10.1037/0021-9010.65.1.96

Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology*, *85*(4), 587-596. https://doi.org/10.1037//0021-9010.85.4.587

Zohar, D. (2010). Thirty years of safety climate research: reflections and future directions. *Accid Anal Prev*, *42*(5), 1517-1522. https://doi.org/10.1016/j.aap.2009.12.019

Appendix

Final Ethics Approval

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