THE MODERATING EFFECT OF PERSONALITY TRAITS ON THE RELATIONSHIP BETWEEN MANAGEMENT PRACTICES, LEADERSHIP STYLES AND SAFETY PERFORMANCE IN IRAQ

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By

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ABSTRACT

Existing literature reveals a gap in the empirical knowledge on safety performance in the oil and gas (O&G) industry in Iraq. This study specifically aims to identify the level of safety performance in the Iraqi O&G industry by examining the direct relationship among management practices (safety training, rewards, management commitment, communication and feedback, hiring practices, and employee participation), leadership styles (transformational and transactional), and safety performance (compliance with safety behavior and safety participation) among 713 employees. This study also explores the role of personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) as a moderator of the relationship among management practices, leadership styles, and safety performance. Quantitative data were processed using the Statistical Package for Social Science version 18.0, which includes descriptive statistics, factor analysis, and Pearson correlation. Additionally, multiple regression and hierarchical multiple regressions were used to test the study hypotheses. In identifying interaction effects, significant beta coefficients and post hoc probing by split sample analysis were employed. Results provide general support for the hypothesis of the study, despite a number of differences in the direction of the relationships. Specifically, training, rewards, management commitment, communication and feedback, hiring practices, employee participation, and the transactional leadership style positively related to safety performance, whereas the transformational leadership style did not significantly relate to safety performance. The results also suggest that personality traits have a positive and significant moderating influence on the model. The relationship among management practices, leadership styles, and safety performance indicates that the improvement of safety performance through the management of employees will be beneficial to the Iraqi O&G industry. Finally, this study discusses theoretical and practical implications, as well as recommendations for future research.

Keywords: management practices, leadership styles, safety performance, personal traits, oil and gas industry

ABSTRAK

Karya ilmiah yang sedia ada jelas menunjukkan wujudnya lompang dalam pengetahuan empiris tentang prestasi keselamatan dalam industri minyak dan gas di Iraq. Oleh itu, kajian ini bertujuan untuk mengenal pasti tahap prestasi keselamatan dalam industri minyak dan gas di Iraq. Penelitian kajian ialah untuk menyiasat hubungan secara langsung antara amalan pengurusan (latihan keselamatan, ganjaran, komitmen pengurusan, komunikasi dan maklum balas, amalan pengambilan, dan penglibatan pekerja), gaya kepemimpinan (transformasional dan transaksional) dan prestasi keselamatan (kepatuhan terhadap gelagat keselamatan dan penglibatan keselamatan) dalam kalangan 713 orang pekerja. Kajian ini juga meneliti peranan ciri-ciri personaliti (ekstraversi, sifat berhati-hati, intelek, bersetuju, dan kestabilan emosi) sebagai moderator hubungan antara amalan pengurusan, gaya kepemimpinan, dan prestasi keselamatan. Data kuantitatif diproses dengan menggunakan *Statistical Package Statistik for Social Science versi 18.0*. Ini melibatkan statistik deskriptif, analisis faktor, dan korelasi Pearson. Di samping itu, regresi berbilang dan hierarki digunakan untuk menguji hipotesis kajian. Bagi mengenal pasti kesan interaksi, pekali beta yang signifikan dan *post hoc probing* digunakan dengan memecahkan analisis sampel. Secara umumnya, dapatan kajian menyokong hipotesis kajian walaupun terdapat beberapa perbezaan dalam haluan hubungan. Secara khususnya, latihan, ganjaran, komitmen pengurusan, komunikasi dan maklum balas, amalan pengambilan, penglibatan pekerja, dan gaya kepemimpinan transaksional berhubung secara positif dengan prestasi keselamatan. Sementara itu, gaya kepemimpinan transformasional tidak berkaitan secara signifikan dengan prestasi keselamatan. Dapatan juga menunjukkan bahawa ciri-ciri personaliti mempunyai pengaruh mengawal yang positif dan signifikan dalam model kajian. Hubungan antara amalan pengurusan, gaya kepemimpinan, dan prestasi keselamatan menunjukkan bahawa penambahbaikan prestasi keselamatan melalui pengurusan pekerja akan mendatangkan manfaat kepada industri minyak dan gas Iraq. Akhirnya, kajian ini membincangkan implikasi teoritis dan praktis. Ini termasuklah cadangan bagi kajian akan datang.

Kata kunci: amalan pengurusan, gaya kepemimpinan, prestasi keselamatan, ciri-ciri personaliti, industri minyak dan gas

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

As the world continues its voyage toward modernization, it faces tremendous challenges, specifically in the 21st century. The rapid growth of the global industry has raised concerns on safety and health in the workplace, as an increasing number of occupational accidents and injuries frequently make headline news (OHS, 2010).An occupational accident is defined as an occurrence arising from the course of work, which results in non-fatal or fatal injury (Papazoglou, Aneziris, Konstandinidou, & Giakoumatos, 2009). In addition, an occupational accident is unexpected and unplanned, and can result in one or more workers incurring a personal injury, disease, or death (Visser *et al.*, 2007). Some of the worst occupational accidents over the years include the Flixborough explosion at a chemical plant in the United Kingdom on 1 June 1974, which killed 28 people and seriously injured 89 others (Vaidogas & Juocevius, 2008). Two years after the Flixborough explosion, an occupational accident occurred in a chemical factory in Seveso, Italy on 10 July 1976, which resulted in the death of 37,000 people and in the hospitalization of 2,000 others (Sluka, 2009). Another accident occurred in Bhopal, India on 3 December 1984, killing 1,000 people. This accident in India caused major injuries and health-related problems because of leakage of methyl isocyanate chemicals (Broughton, 2005; Gassert & Dhara, 2005; Skjerve, 2008). In 1986, another horrible accident occurred in Ukraine, Soviet Union, that is, the unforgettable explosion at the Chernobyl reactor. A total of 58 people died, including 30 firemen. Over 2,000 people, who subsequently experienced birth defects and skin diseases, were affected by this accident (Germenchuk, 2001; Vakulovsky, 2001). Following the Chernobyl explosion is the Piper Alpha Oil platform accident at the North Sea in 1988, which resulted in a death toll of 167 people (Hull, Alexander & Klein, 2002). In 1998, a similar type of accident, known as the Esso gas plant explosion, occurred in Southeast Australia. This accident resulted in two fatalities and wounded eight people, aside from an estimate of AUD1 billion worth of damages (Barnett, 2006; Nicol & James, 2001).

In 2001, the world witnessed another occupational accident. An explosion occurred in a chemical factory in Toulose, France, which resulted in 30 fatalities and 10,000 injuries. The explosion also damaged 27,000 houses and 1,300 companies (Biais, Mariotti, Rochet, & Villeneuve, 2007; Salvi & Dechy, 2005). In 2005, another explosion occurred in Buncefield, UK, an oil storage and transfer depot, injuring 43 people. Although no fatalities were recorded, 2,000 families had to be migrated (HSE, 2009; Johnson, 2009).A recent accident occurred in the Gulf of Mexico, known as the Deepwater Horizon Oil Spill or BP Oil Spill (White, 2010; Welch & Joyner, 2010). This massive oil spill is considered the biggest offshore spill in US history (Brown & Dearen, 2010; Leigh, 2010). The spill started to spread on 20 April 2010. Given that the spill originated from a sea surface oil gusher, an internal oil well explosion was triggered approximately 64 km southeast of the Louisiana coast in the Macondo Prospect oil field. A total of 11 platform workers were killed, and 17 were injured, while 98 survived without any serious physical injury. On 1 June 2010, BP declared that the approximate expenditures reached $990 million, adding that the figure may further increase as more environmental damages are incurred in US territories, among fishermen, and in other related industries (Welch & Joyner, 2010).

Because of the severity and the costs involved of occupational accidents as shown above, many countries and companies have been increasingly interested in this issue (Rikardsson & Impgaard, 2004). Occupational accidents result in workforce and economic loss. Companies consequently suffer from direct costs, which often include medical fees, death claims, legal fees, equipment damage, and expenses for safety and health management (Pessemier, 2009). Indirect costs are also acquired, which may be significantly higher, because such costs may include loss of production, necessitation of training programs, increased insurance costs, and a detrimental loss of public confidence (Rikhardsson & Impgaard, 2002). With direct and indirect costs involved, actions must be undertaken to curb, if not entirely stop, the occurrence of occupational accidents. This action can be in the form of a systematic and scientific inquiry to examine the factors that contribute to occupational accidents so that effective measures can be implemented.

An industry likely to face occupational accidents is the oil and gas (O&G) industry. According to Gordon and Mearns (2005), and Mearns and Yule (2009), the global O&G industry is a high-risk industry because of its nature and the difficult working conditions it involves. Similarly, Kane (2010) indicates that the O&G industry has a very high risk factor and has a high number of workplace fatalities and injuries. Iraq, an oil-rich country, is not an exception to occupational/industrial accidents. Based on a personal communication with the CEO at the Iraqi Oil Ministry, the O&G industry recorded 506 accidents in 2010, including 77 fatal work injuries and 576 non-fatal work injuries. Fatal injuries refer to deaths resulting from traumatic injuries or other external causes in the workplace (Governor *et al.*, 2002). Meanwhile, non-fatal injuries refer to injuries that result in physical or emotional damage. These injuries can be relieved by medical aid within a certain time period and do not usually result in death (Cryer *et al.*, 2008). Table 1.1 shows a comparison between the number of fatal and non-fatal injuries that resulted from occupational accidents in the O&G industry and those in the manufacturing industry from 2005 to 2010 in Iraq.

Table 1.1 clearly shows that the O&G industry has almost two times more occupational accidents than the manufacturing industry, justifying the need to study this phenomenon. The results also reflect the declining number of occupational accidents within the O&G industry over the years, such as the trend observed in 2009. The significant and consistent decline in the number of occupational accidents is not because of changes in work design or in working conditions, but rather because of the reduction of production capacity to 45% (Blanchard, 2010). Although a ministerial order has been issued on the reduction in production capacity, occupational accidents remain an important safety issue in the Iraqi O&G industry.

Table 1.1
Comparisons of Occupational Accidents in Iraqi Oil and Gas Industry and Manufacturing Industry (2005-2010)

Items	**2005**		**2006**		**2007**		**2008**		**2009**		**2010**	
	O&G	**M**	**O&G**	**M**	**O&G**	**M**	**O&G**	**M**	**O&G**	**M**	**O&G**	**M**
Occupational accidents	647	312	578	232	623	442	588	244	322	189	506	76
Fatal injuries	89	33	45	18	67	28	85	10	34	17	77	18
Non-fatal injuries	502	251	413	112	454	220	418	102	334	166	576	202
Total accidents	1238	596	1036	362	1144	690	1091	356	690	372	1159	296

Note.
M = Manufacturing; O&G = Oil and Gas
Source: Personal communication with CEO for Iraqi Oil Ministry (2011) with the CEO of occupational safety in the Iraqi Manufacturing Ministry (2011)

Table 1.2 displays the statistics of different types of non-fatal injuries from occupational accidents in the Iraqi O&G industry within a six-year period, from 2005 to 2010. The table reveals the multiplicity of non-fatal occupational injuries in the O&G industry. Similar to occupational accidents, the figures declined in 2009. However, a scientific investigation to examine this phenomenon, especially in the Iraqi O&G industry, remains critical because if accidents and injuries are not addressed, government revenues can be seriously affected (Blanchard, 2010). Occupational injuries, for example, cause absenteeism because of sickness and are said to have a psychological impact on other workers (Mearns & Yule, 2009; Williams, 2006).

Table 1. 2

Types of Non-fatal Injuries in Iraqi Oil and Gas Industry (2005-2010)

Items	2005	2006	2007	2008	2009	2010
Chronic lung disease from long-term exposures to chemicals and toxic gases	62	44	71	52	38	81
Irritation from high levels of benzene and hydrogen sulfide fumes	38	27	40	30	23	34
Headaches and mental disturbances	99	94	81	97	71	97
Psychosis and peripheral neuropathies	42	37	44	28	22	49
Injury cancer from exposures to carcinogenic materials	24	13	26	12	5	33
Fracture in upper limbs	46	50	35	59	41	58
Fracture in lower limbs	53	44	46	38	30	56
Minor burns in skin	34	42	49	31	27	45
Severe burns in skin	42	28	16	29	34	48
Facial lacerations	25	11	28	10	18	32
Sprain foot	37	23	18	32	25	43

Source: Personal communication with CEO for Iraqi Oil Ministry (2010)

The O&G industry is considered one of the most important industries in Iraq because it contributes over 88% of foreign exchange earnings, 84% of the value of all exports, 90% of government revenues, and over 75% of the gross domestic product (GDP). Moreover, this industry offers a large number of employment opportunities for Iraqi people (Cordesman, 2009; Looney, 2006; Williams, 2006). Although the agricultural sector employs 35,296 people and the manufacturing industry employs 63,667 people (OCHA, 2009), the O&G industry has the highest number of employees at 79,900 (Jaffe, 2009). Considering the number of employees in the O&G industry, a comparatively higher number of accidents and injuries occur in the industry sites (Ministry of Oil & Gas Report, 2009). Thus, in reference to Table 1.1, the industry has twice the number of occupational injuries compared with the manufacturing industry.

According to Al-Moumen (2009), with the entire infrastructure damaged because of the global sanctions imposed on Iraq and because of the American invasion of Iraq in 2003, O&G accidents had become inevitable. Safety in the Iraqi O&G industry is a very important issue because of the country's dependence on oil production and exports (Blanchard, 2010). In addition, Iraq possesses over 115 billion barrels (bbl) of proven oil reserves. Therefore, Iraq is second in rank among all oil inventories worldwide, after Saudi Arabia (Muttitt, 2005; Jaffe, 2006; Kalha, 2009). However, the former Iraqi Oil Minister Thamer Ghadban said in August 2004 that Iraq possesses as many as 214 bbl, ranking it first in the world in terms of oil reserves (Blanchard, 2009).

An occupational accident in the Iraqi O&G industry generally has an enigmatic and direct impact on production (Congress of Iraq, 2009). The Iraqi Congress Report states that Iraq is currently working with a production capacity of 45% in the oil industry and bears the costs of ongoing obstacles in O&G production. The question raised by scholars and experts is whether the Iraqi government and O&G companies are capable of efficiently and effectively managing workplace safety to reduce occupational accidents (Al-Moumen, 2009; Fattouh, 2007; Hämäläinen, Saarela, & Takala, 2009).

1.2 PROBLEM STATEMENT

Workplace safety is a vital concern in the O&G industry because of increasing accident and injury rates (Morel, Amalberti, & Chauvin, 2008; Helberinglon, Flin, & Mearns, 2006). Thus, previous studies have shown considerable interest in addressing the issue (e.g., Geller, 2000; Helberinglon *et al.*, 2006; McCon, 1997; Manzella, 1999; Morel *et al.*, 2008). Three approaches have been primarily used to explain the occurrence of workplace accidents and to present solutions for the prevention or reduction of such occurrences. These approaches are based on the technological, system, and management perspectives. The technological perspective essentially argues that workplace accidents occur because of some technological errors, such as in software applications, physical layout, and human operations, as well as in tools, devices, methods, and machinery that are used in the organization (e.g., Bowander, 1987; Garrick, 1998; Rognin, Grimaud, Hoffman, & Zegha, 2002; Vinodkumar & Bhasi, 2010). On the other hand, the system perspective argues that workplace accidents occur because of the failure of management systems or behavior with regards to safety practices. In other words, accidents occur because a proper system for safety and prevention is not in place, as can be evidenced by the lack of safety policies, employee responsibility, inspection, correction, and standards for the prevention of accidents in the workplace (Bellamy, 2010; Cooper & Phillips, 2004; Goetsch, 2011; Strickoff, 2000).

While the two perspectives argue that workplace accidents occur due to faulty work systems and operations, the management perspective has a different viewpoint. This perspective postulates that workplace accidents occur because of human error (Bottani, Monica, & Vignali, 2009; Cigularov, Chen, & Rosecrance, 2010; Enshassi, Choudhry, Mayer, & Shoman, 2008; Fahlbruch, 2010; Gordon, Flin, & Mearns, 2005; Jiang, Yu, Li, & Li, 2010; Mearns & Yule, 2009; Ryerson & Whitlock, 2005). Thus, if proper procedures and knowledge for safety are provided to employees, human errors, and consequently, workplace accidents, can be reduced (Gordon, Flin, & Mearns, 2005).By considering technological and system errors as valid, the influence of human error in workplace accidents is discounted. In fact, statistics have shown that 80% to 90% of all industrial accidents are attributable to human errors and to incorrect procedures during task implementation (Abdullah *et al.*, 2009; Fleming & Lardner, 1999). The management perspective is guided by human factor theory and by Peterson's accident theory. Theory of human factors explains the occurrence of accidents on the basis of "human error" or the inability of workers to manage work overload, to provide appropriate response, and to conduct proper activities (Goetsch, 2011). Peterson's accident theory argues that management failure and personnel failure contribute to workplace accidents (Abdelhamid & Everett, 2000; Geller, 2006; Goetsch, 2011; Salmon & Lenné, 2009). Hence, the present study employs the management perspective in its attempt to explain workplace safety performance in the Iraqi O&G industry. Furthermore, Barling (2001) argued that the management perspective has the capacity to address threats and situations that contribute to the occurrence of human errors by raising the level of safety in the organization. This perspective has also been applied in past studies (e.g. Enshassi *et al.*, 2008; Hsu, Lee, Wu, & Takano, 2008; Jiang, Yu, Li, & Li, 2010) to explain the issue of human errors as potential causes of occupational accidents.

This study also attempts to investigate the role of management practices and leadership styles in workplace safety performance in the Iraqi O&G industry. Management practices and leadership styles are chosen as variables because Peterson's accident theory indicates the accountability of management failure in workplace accidents. The inclusion of management practices in understanding safety performance is important for several reasons. First, according to Barling (2001), management practices have the capacity to address threats and situations that promote the occurrence of human errors by raising safety standards in an organization. Second, management practices call the attention of employees and consequently reduces human errors in the organization (Cabrera, Fernaud & D´ıaz, 2007; Dorji & Hadikusumo, 2006; Gordon, Flin, & Mearns, 2005; Skjerve, 2008; Vinodkumar & Bhasi, 2010). Finally, management lays out the rules, procedures, and information to the employees, resulting in reduced accidents and injuries in organization (Gordon, Flin, & Mearns, 2005). Thus, management practices can be viewed as actions conducted by the management to promote the standards of safety performance among employees in the workplace.

Vredenburgh (2002) emphasized that management practices, such as safety training, reward, and management commitment, among others, are important factors to consider in reducing the probability of employee injuries and in increasing the level of safety performance in the workplace. Ali, Abdullah, and Subramaniam (2009) empirically showed that management practices had a significant influence on safety performance in terms of the reduction of workplace injuries. Despite this purported significance, empirical evidence on the role of management practices in influencing safety performance is limited (Vinodkumar & Bhasi, 2010), particularly in the O&G industry (Blanchard, 2010; Skjerve, 2008). Given the economic and the socio-political importance of the O&G industry in Iraq, empirical investigation on this matter is justified and warranted so that measures can be employed to enhance workplace safety performance.

Safety failure can also be attributed to leadership styles (e.g. Amorose & Anderson–Butcher, 2007; Flin & Yule, 2004; Taj *et al.*, 2010). Leadership styles are considered to be important in achieving quality safety performance (Adamshick, 2007; O'Dea & Flin, 2003; Künzle, Kolbe, & Grote, 2010; Lu & Yang, 2010; Wu, Liu, & Lu, 2007) because a good leader can control the rate of human errors (Adamshick, 2007; O'Dea & Flin, 2003). In essence, leadership style can also influence employee behavior and their performance toward improved safety (Andersen *et al.*, 2011; Lu & Yang, 2010; Yang *et al.*, 2010; Yukl, 2006). Another argument was mentioned by Yang *et al.* (2010) that leadership styles can improve safety performance through the formulation of a clear message on what must be done in the future to address human errors, and consequently, to reduce the level of occupational accidents. Although leadership can reportedly enhance workplace safety and improve safety performance, available research remains limited, particularly on the O&G industry (Al-Moumen, 2009; Congress Report, 2009; Kalha, 2009). In addition, the extant literatures show that scholars appeared to focus more on the role of transformational and less on transactional leadership style in their empirical investigations on the influence of leadership on safety performance. Consideration of both styles is important as scholars have indicated that both of these styles are not in conflict with each other but they tend to complement one another (Inness, Turner, Barling, & Stride, 2010; Schutte, 2010).

While previous literature has shown the significant role of management practices and leadership styles in safety performance at the workplace, various approaches by different employees regarding safety have also been emphasized. Some employees seriously consider precautionary measures, while others seem uninterested and have a negative attitude toward the improvement of safety performance (Lu & Yang, 2010). This observation suggests that personal factors, such as personality traits, are important variables to consider when examining the issue of workplace safety. Studies have found that personality is a variable that can effectively prevent work-related injuries and accidents (Geller, 2004; Geller & Wiegand, 2005; Samad, 2007; Zhou, Fang, & Wang, 2008). However, no study has considered investigating the role of personality traits in moderating the relationship between management practices and leadership styles, particularly in terms of safety performance. This gap must be filled, especially given that individuals have distinct personal traits, such as extraversion, conscientiousness, intellect, agreeability, and emotional stability, which reflect how they behave at the workplace. Therefore, personality traits can help deepen our understanding of the importance of management practices and leadership styles in the implementation of procedures to improve safety performance in the workplace.

The underpinning theory of this study is social exchange theory. The theory indicates that when an employee acts in a manner that can benefit everybody, the requirement for future reciprocity or mutual relationship is created, resulting in behavior designed to benefit the said employee (Goulder, 1960; Settoon, Bennett, & Liden, 1996). This study examines management practices and leadership styles as independent variables that serve as the "exchange" media between the organization and the employees, thus influencing safety performance in the O&G industry.

1.3 RESEARCH QUESTIONS

Based on the discussion above, following are the research questions to be answered:

(a) What is the level of safety performance in the O&G industry in Iraq?

(b) Do management practices influence safety performance?

(c) Do leadership styles influence safety performance?

(d) Do personality traits moderate the effect management practices and leadership styles on safety performance?

1.4 RESEARCH OBJECTIVES

This study is designed to examine the relationship between management practices, leadership styles and personality traits on safety performance in the Iraqi O&G industry. Specifically, the present research attempts to meet the following research objectives:

1. To identify the level of safety performance in the O&G industry in Iraq.
2. To examine the influence of management practices on safety performance.
3. To investigate the effect of leadership styles on safety performance.
4. To examine the moderating role of personality traits on the relationship between management practices and leadership styles on safety performance.

1.5 SCOPE OF STUDY

The study was conducted on the Iraqi O&G industry. This research focuses on the development of a model that supports the O&G industry in consolidation of information on its management practices and leadership styles for the improvement of safety performance. The respondents of this study were employees who are directly exposed to occupational safety threats (Costella, Saurin, & Guimares, 2009; Yang *et al.*, 2010), including technicians, electricians, mechanics, welders, drillers, engineers, and other relevant employees in the Iraqi O&G industry.

The Iraqi O&G industry was chosen for the following reasons:

1. Occupational accidents can negatively affect the performance of the industry and the economy, especially with the reduction of the production capacity of the Iraqi O&G industry to 45% at the pre-war level (Congress Report, 2009).
2. The O&G industry is a high-risk industry (Kane, 2010).
3. The O&G industry is a main contributor to the Iraqi economy. This industry contributes over 88% of foreign exchange earnings, 84% of the value of all exports, 90% of government revenues, and over 75% of the gross domestic product (GDP) (Cordesman, 2009; Looney, 2006; Williams, 2006).

1.6 SIGNIFICANCE OF THE RESEARCH

This study focuses on the improvement of safety performance by addressing the relationship among managerial practices, leadership styles, and worker personality in the Iraqi O&G industry. This study is expected to benefit both theoretical and practical levels as regards to safety.

At the theoretical level, there is a scarcity of empirical research on safety performance in the Iraqi O&G industry. This study is an empirical attemptto investigate the influence of managerial practices and leadership styles on safety performance in O&G industry in Iraq. Unlike other studies that give emphasis on the technological or systems factors, this study views safety performance from the management perspective. In addition, this study also help expand the boundary of knowledge by applying social exchange theory in understanding safety performance. Furthermore, the present study adds to the existing literature by providing empirical evidence on the moderating influence of personality on management practices, leadership style, and safety performance.

The findings of the present study have also significant contribution to practice. The findings will help to create awareness on the need to accomplish safety performance at the individual level. The study underscores the importance of the formulation of effective and efficient policies and strategies that provide for a safe working environment toward the improvement of performance of safety and the reduction of occupational accidents and injuries at the workplace. In addition, the outcomes of this study could assist managers and practitioners in the O&G industry, as well as policymakers, in designing and implementing relevant measures to improve workplace safety, specifically by looking into existing management practices and leadership styles and by considering the personality traits of employees when implementing safety interventions.

1.7 OUTLINE OF THESIS

This thesis has five chapters. Chapter 1 presents a discussion on the background of the study, as well as the problem statement, research questions, research objectives, scope of study, and the significance of the research. Chapter 2 discusses past literatures on management practices, leadership styles, and personality traits, as well as how these factors affect safety performance. The underpinning theory of the study is also elaborated in this chapter. Chapter 3 explains the methods used to conduct the research, which was based on the adopted research model drawn from the literature. Research design, measurements, data collection, and sampling techniques are specific issues that are also discussed in this chapter. This chapter also explains the formulation and the testing of the hypotheses of this research. Chapter 4 presents the results of the study based on the data collected. Finally, Chapter 5 offers a detailed discussion of the findings, recommendations for future research, implications and limitations of the study, and concluding remarks.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter has provided the background of the research and highlighted the research problem and issues. The importance and scope of this study have been justified as well. This chapter addresses the current state of research and the existing knowledge on human resource management, diversity perceptions, and practices based on empirical studies conducted on safety performance. This chapter aims to facilitate deeper understanding of a variety of variables examined with safety performance. The chapter starts with a review of several concepts of safety performance and then provides an overview of related studies on safety performance. The human factors that affect safety performance are then identified. The second part reviews the empirical studies on management practices and leadership styles, which have been identified as the predictor. The final part discusses personality traits as the moderating variable, as well as the underpinning theory.

2.2 SAFETY PERFORMANCE

The term safety performance is used to refer to an organization's safety level. The most common safety performance indicators are delineated by the Occupational Safety and Health Administration in the US, which statistically records workplace accidents (Manzella, 1999; Arezes & Miguel, 2003; Mannan, O'Connor & Keren, 2008; Clarke, 2006). Safety performance refers to the level of safety that controls the number of accidents and injuries in a workplace (Siu, Phillip, & Leung, 2004). Previous literatures (Chang & Yeh, 2004; Huang, Smith, & Chen, 2006; Moses & Savage, 1992; Moses, 1994; Mejza, 1998) refer to safety performance as the probability that workplace accidents would result in fatal injury or property damage.

According to Vinodkumar and Bhasi (2010), the key indicator of safety performance is the company's accident or injury levels. Numerous studies have employed an accident statistic for safety performance in organizations (Akson & Hadikusumo, 2007; Clarke, 2006; Sawacha, Naoum & Fong, 1999). Indeed, according to the European Transport Safety Council (ETSC), safety performance is defined as "changes over time in the level of safety, with a reduction in the number of accidents or the number of killed or injured people, which can be regarded as an improvement in safety performance" (ETSC, 2001, p. 11).Safety performance is one of the significant measures for organizations to maintain the protection of their workers (McDonald, Corrigan, Daly & Cromie, 2000).

A rather different definition is offered by Kohli (2007), who defines safety performance as "an integrated set of regulation and activities aimed at improving safety" (Kohli, 2007, p. 8), which is usually self-reported (Siu *et al.*, 2004; Huang, Ho, Smith, & Chen, 2006) with the indication to promote the safety and health of workers (Burke *et al.*, 2002; Hofmann & Stetzer, 1996). From an individual perspective, Burke *et al.* (2002) define safety performance as "actions or behavior that individuals exhibit in almost all jobs to promote the health and safety of workers, clients, the public, and the environment" (p. 432).

The above definitions of safety performance stress the need for organizations to prevent their workers from suffering accidents and injuries (Kelloway, Stinson, & MacLean, 2004). Maintaining safety performance is a challenge for organizations (Wu, 2000; Yang *et al.*, 2010). Hughes, Tippett, and Thomas (2004) argue that safety performance should be the primary determinant of organization performance, regardless of other indicators. Similarly, others researchers even argue that, for some organizations, safety performance should be the primary measure of organization performance, regardless of the outcome of the other classical measures (Wu, 2009), in which safety performance is usually evaluated by the accident rate in the workplace. Indeed some scholars maintain that a key element in the success of any organization is the effective prevention of accidents (Huang *et al.*, 2006; Wu, Chen, & Lu, 2008).

In light of the above definitions, the present study defines safety performance as an effort taken by an organization with the ultimate goal of reducing workplace accidents and injuries.

2.2.1 Empirical Studies on Safety Performance

Various literatures discuss safety performance as a dependent variable measured by a range of safety outcomes, including accident rates (e.g. Mearns *et al.*, 2003; Siu *et al.*, 2004), injuries (e.g. Murray, Fitzpatrick, & O'Connell,1997; Fabiano, Curro, & Pastorino, 2004; Zohar, 2002), safety commitment or involvement (e.g. Dedobbeleer & Beland, 1998; Oliver, Cheyne, Tomas, & Cox, 2002), and safety compliance and participation (e.g. Neal, Griffin, & Hart, 2000; Neal & Griffin, 2006; Lu & Yang, 2010; Pedersen & Kines, 2011).

In this section, empirical studies on safety performance are reviewed, starting with the two dimensions adopted in this study to measure safety performance, namely safety compliance and safety participation, widely used to measure safety performance (Neal & Griffin, 2002; Neal & Griffin, 2006; Schutte, 2010; Lu &Yang, 2010; Pedersen & Kines, 2011). Next, a review of empirical studies on the other dimensions in measuring safety performance is then presented.

Compliance is one of the important elements to explain safety performance. The term safety compliance refers to the "core behavior workers need to perform to maintain workplace safety. Such behavior includes maintaining the standard of work procedures and wearing personal protective equipment" (Neal & Griffin, 2002, p.70). Additionally, safety compliance deals with the efforts employees exert to maintain workplace safety by following the organizational safety based procedures, rules, and regulations (Neal & Griffin, 2006). In a similar vein, Schutte (2010) refers safety compliance as behavior that is focused on meeting the minimum work safety standards, such as following safety procedures in the workplace. Neal *et al.* (2000) define safety compliance as "adhering to safety procedures and carrying out work in a safe manner" (Neal *et al.*, 2000, p. 101). According to Inness, Turner, Barling and Stride (2010), safety compliance is one of the components of task performance, because it is basically encompasses the core safety activities that are needed by individuals to effectively maintain safety in the workplace.

Another concept in safety performance is safety participation, which refers to a behavior that indirectly contributes to a worker's personal safety and encourages the development of work environment that supports safety. Safety participation comprises of a variety of activities, including helping with safety-related issues, active involvement in voluntary safety activities, and attending safety meetings, among others (Broadbent, 2004; Neal & Griffin, 2006; Lu & Yang, 2010). Neal *et al.* (2000, p. 101) illustrate safety participation as "helping co-workers to promote the safety program within the workplace, demonstrating initiatives, and putting effort into improving safety in the workplace". In other words, safety participation explains behavior that does not directly influence the personal safety of employees but can help educate the public on an environment that supports safety (Neal & Griffin, 2002; Neal *et al.*, 2000). In this context, safety participation is regarded as a form of contextual performance.

The two dimensions to measure safety performance, namely compliance with safety behavior and safety participation, have been employed by previous researchers. For instance, Neal and Griffin (2002) conducted a study to examine the mediating roles of knowledge of safety procedures, compliance motivation, and participation motivation on the relationship between safety climate and safety performance among 326 employees from manufacturing firms in Australia. The findings of the study revealed that all the mediating variables in this study fully mediated the relationship between safety climate and safety performance (safety compliance and safety participation). A similar result was also obtained by Neal *et al.* (2000) in a study that examined the effects of general organizational climate on safety climate and safety performance (safety compliance and safety participation). The sample comprised 525 employees from 32 work groups in a large Australian hospital (response rate of 56%). The results indicated that a specific climate for safety is more strongly related to safety performance than with the general climate of the organization. The study also found that safety climate had an effect on individuals, safety compliance, and safety participation.

Pedersen and Kines (2011) conducted a study on safety motivation and safety performance (safety compliance and safety participation).Self-administered questionnaire surveys were used to collect data from of 532 workers of 22 small, medium, and large metal or wood manufacturing enterprises in Denmark. Seven occupational safety motivation questionnaire items were developed on the basis of a theoretical model with three forms of motivation for safety compliance/participation as follows: normative, social, and calculated motivations. All items in the questionnaire were rated on 4-point likert scale ranging from 1, which represents strongly agree to 4, which is strongly disagree. The study found a significant positive relationship between safety motivation and safety performance. On a similar note, Lu and Yang (2010) conducted a study on five major container terminal companies in Taiwan. The study examined the relationship between safety leadership (safety motivation, safety policy, and safety concern) and safety performance (safety compliance and safety participation). The study used survey data collected from 336 respondents. The results indicated that safety motivation and safety concern positively affected safety compliance and safety participation.

A study by Jiang *et al.* (2010) examined the moderating effects of safety knowledge/behavior on the relationship between safety climate and safety performance, using self-administered questionnaires, which were administered on 631 employees of two petroleum and chemical corporations in China, with a response rate of 84.2%. Hierarchical linear modeling analyses revealed that safety knowledge/behavior and safety climate moderated the relationship between safety climate safety performances. A more positive safety climate facilitated stronger effects of safety knowledge/behavior on safety performance. In a related study, Vinodkumar and Bhasi (2010) found safety compliance and safety participation had a positive significant relationship with safety knowledge and safety motivation among 1566 employees from eight major accident hazard process industrial units in Kerala, a state in southern part of India.

Tharaldsen *et al.* (2010) conducted a study to examine the impact of group level characteristics, structural work factors, and trust on safety performance (safety compliance and safety participation) in the Norwegian and United Kingdom (UK) Continental Shelves. The number of participating platforms in the survey was three in the UK and nine in Norway, and the response rate was approximately 67% on both shelves with 170 employees in the UK and 621 employees in Norway. The findings of the study showed that group level characteristics, structural work factors and trust were significant predictors of safety performance. In a related study, Clarke (2006) conducted a study to examine the relationships between safety climate and safety performance using occupational accidents as moderators. The study found strong relationship between safety climate and safety performance (compliance with safety behavior and safety participation).

In another research project, Kim and Park (2001) determined the mechanism of the effect of safety climate, safety knowledge, and safety motivation on such safety performance factors as safety behavior and occupational accidents in Korea. Data were collected from 1,101 employees of 217 selected workplaces throughout Korea. The questionnaire comprised 38 items utilizing a five-point Likert scale on safety-related characteristics, including questions on safety knowledge, safety motivation, safety compliance, safety participation, and the five safety climate subscales. The study found that an organization's safety climate affected an individual's safety motivation and safety knowledge. In turn, such personal characteristics affected safety compliance and safety participation and directly contributed to the reduction in the number of accidents. Similarly, Neal and Griffin (2006) conducted a study to examine the effects of safety climate and safety motivation on safety compliance and safety participation in Australia. Data were collected using questionnaires distributed to over 700 employees in an Australian hospital. The findings suggested that safety participation had a positive significant relationship with safety motivation, further showing an increase in safety participation, but not in safety compliance.

Jaafar (2010) conducted a study to investigate the affection of facets of work safety scale (safety perception of job safety, co-work safety, supervisor safety, management safety and satisfaction of safety programme) on safety performance (safety compliance). Self-administered questionnaires were used to collect data from 139 respondents in a teaching hospital in Kuala Lumpur. The response categories for the questionnaire items in this study ranged from 1= strongly disagree to 5= strongly agree. The study found that co-work safety, job safety and satisfaction of safety programme had a significant positive effect on safety performance (safety compliance).

In another study, Singer *et al.* (2009) examined the relationship between safety climate and safety performance in the US. Data on safety climate perception were collected from senior managers and frontline personnel of 91 hospitals using questionnaires. The study found a significant link between organization safety climate and safety performance in hospitals. On a similar note, Siu *et al.* (2004) conducted a study to examine the mediating role of psychological strains on the relationship between safety climate and safety performance. This study was based on questionnaires distributed to 27 construction sites and on interviews, with data collected from construction workers in Hong Kong. The results showed that psychological strains partially mediated relationship between safety climate and safety performance. Furthermore, the results revealed a significant direct relationship between safety climate and safety performance.

A study by Cooper and Phillips (2004) was conducted to explore safety climate and safety performance relationship. Data were collected from 374 plant personnel of a packaging production plant using questionnaires. This study found positive relationship between safety climate and safety performance. Likewise, Clissold (2004) conducted a study to explore the relationship among safety climate, psychological climate, and safety performance (safety reporting and behavior factor). Data were collected from 800 questionnaires administered to a population of employees of a large service provider in Australia. The researcher found that the incorporation of the psychological climate factors in the relationship between safety climate and safety performance is significant. The study also found a significant relationship between safety climate and safety performance.

A study conducted by Wadsworth and Smith (2009) on various industrial sectors in the UK measured safety climate through safety culture and studied the effect of occupational safety and health practitioners' experiences on safety performance. The findings indicated that the perception of organizational safety culture was consistently and independently associated with corporate safety performance. Furthermore, this influence was apparent among organizations in numerous industrial sectors. In a another study, Burke *et al.* (2002) focused on two studies with a four-factor of safety performance and performance factors namely, Exercising Employee Rights and Responsibilities, Engaging in Work Practices to Reduce Risk, Communicating Health and Safety Information and Personal Protective Equipment. The findings supported the relationship between safety performance and performance factors.

Pessemier (2009) examined the relationship between social and organizational factors that can influence safety performance. The study presented a model based on safety performance in fire services in the US. The findings indicated a significant influence of social and organizational factors on safety performance. Wu, Lee, Shu and Shu, (2010) conducted a study to investigate the influence of organizational factors (defined as the presence of safety manager and safety committee, ownership, size and location), individual characteristics (i.e. age, job gender, title, tenure, , experience, training, and work site) on safety performance, among 465 employees from four colleges in Central Taiwan. The data were collected using questionnaire administered on the respondents. The study showed that size, accident experience, safety committee, gender, safety and accident experience were significant predictors of safety performance.

Razuri, Alarcón and Diethelm (2007) concentrated on construction projects in Chile to investigate how a safety performance could be improved and to identify factors that significantly determine safety performance in the context of construction projects in Chile. Self- administered questionnaires were administered on the survey's participants, at 60 construction sites. The study found 14 factors, including behavior-based safety program, specialized training for workers, orientation and specialized training for management, among others were identified as significant factors. In addition, this study demonstrated a best safety practices implemented was correlated with the project injury rate.

Al-Yusuf (2009) conducted a study to examine the effect of safety culture on safety performance (safety compliance and safety participation) in the manufacturing industry. The sample comprised 520 employees from two industries namely petrochemical industry and chemical fertilizer industry in Iraq (response rate of 51%). The results supported the relation between safety culture and safety performance. Similarly, Burke *et* *al.* (2002) examined the relationship between safety performance and performance factors in USA. Data were collected from 574 hazardous waste workers who provided anonymous ratings of the safety performance of their coworkers. The results supported the relation between safety performance and performance factors.

In another research study, Zacharatos (2001) conducted a study to examine the relationship between high performance work systems and safety performance (safety compliance), mediated by trust in management and safety climate among 196 employees of two organizations from the petroleum and telecommunications industries in Canada. The results supported the relation between high performance work systems and safety performance.

A study by Parboteeah and Kapp (2008) conducted to examine the relationship between ethical climate and safety performance (safety compliance and safety participation) from five manufacturing plants in the Midwest. Self-administered questionnaires were used to collect data from 237 employees. The results supported the relation between ethical climate and safety performance. Likewise, Yang *et al.* (2010) investigated the relationship among leadership behavior, safety culture, and safety performance in Taiwan's healthcare industry among 350 hospital workers. A total of 195 valid responses were received, achieving a 55.7% response rate. This study found that safety performance was affected by contingency leadership and a positive patient safety organization culture. Results also showed that leadership behavior affected safety culture and safety performance in the healthcare industry.

Martinez-Corcoles *et al.* (2013) conducted a study to examine the relationship between empowering team leadership and safety performance (safety compliance and safety participation). Self-administered questionnaires were administered on 479 employees from two Spanish nuclear power plants to collect data, with a response rate of 65.1 %. The study found that empowering team leadership had a significant positive effect on safety compliance and safety participation.

Turner *et al.* (2012) conducted a study to examine the relationship between job demands and safety performance of seven hospitals in United Kingdom among 280 employees from emergency departments. The study found that positive relationship between job demands and safety compliance and safety participation. Results also showed that job control and social support had a significant effect on safety compliance and safety participation. In a different study, Britto, Corsi and Grimm (2010) conducted a study to examine the relationship between financial performance and safety performance in USA. Self-administered questionnaires were administered on 657 carriers across all major industry segments to collect data. The study found that financial position had a significant positive effect on safety performance.

In summary, the aforementioned studies found safety performance to be related to accidents and injuries at the workplace. Additionally, safety performance was revealed to play an important role in the success of organizations. Numerous studies indicated a positive relationship between safety performance dimensions (safety compliance and safety participation) and other variables.

2.3 HUMAN FACTORS AFFECTING SAFETY PERFORMANCE

Numerous human factors are said to affect safety performance. In general, three groups of human factors can be identified. They are behavior factors, individual and social factors, and psychological factors, which are discussed below.

Human factors are important in explaining human involvement in safety behavior (Fahlbruch & Wilpert, 1999). In some contexts, human factors and human errors are used synonymously (Clissold, 2005; Fahibruch, 2010). Human factors refer to "environmental, organizational, and job factors and human and individual characteristics which influence behavior at work in a way which can affect safety" (HSE, 1999, 47). Additionally, human factors are defined as all things that need to be controlled to obtain reliable human performance (Fahibruch, 2010). According to the definition, human factors can be classified into job factors (task, stress, work environment, procedures, displays, and controls), individual characteristics (competence, skills, personality, attitudes, and risk perception), and organizational factors (leadership, supervision, resources, work processes, planning, communication, and culture).

In essence, human factors are concerned with employee discipline, which refers to the matching of capabilities, limitations, and needs based with human behavior (Bellamy, Geyer, & Wilkinson, 2008). Additionally, improvement of occupational safety and workers' health is contingent upon organizational factor, individual characteristics and job factors, (Tam, Zeng, & Deng, 2004; Fahibruch, 2010).

Numerous studies have addressed the issue of human factors and their relationship with occupational accidents and safety performance. For instance, Wolfram (1993) found that human factors played a prominent role in raising the level of safety performance and in reducing occupational accidents. Wolfram argued that occupational accidents occur because of ignorance, weak control, misinterpretation, and fatigue. Additionally, the UK HSE (2003) stated that 80% of accidents may be partly attributed to the actions or omissions of people or to the effects of human factors in an organization. The University of Aberdeen (UK HSE, 2003) was contracted by the UK HSE to conduct a study on human factors. One of the goals was to facilitate better understanding of human and corporate factors in safety. The research comprised two phases: (1) a benchmark study identifying, analyzing, and sharing the best practices on human factor safety-related issues; (2) the development of a program to train staff on human factor issues. The study found several human factors to significantly affect safety, including the propensity to report occupational accidents and injuries, communication about safety, satisfaction with safety activities.

Gordon *et al.* (2001) proposed a model to describe how human factor affect the occurrence of an accident. The model formed the basis for the systematic collection of data on the subject. Human interaction within the accident process involves at least four basic stages, including situation awareness, which measure the extent to which individuals to recognize and react accurately to dangerous situations action errors, error recovery, refers to the consequences of the accident can be prevented, threats, which consists of internal and external factors that may initiate an accident or affect how serious an accident happens. The study proposed a methodology that employs a structured approach for the incorporation of human factor capability in accident models, which was useful in the model development.

On the other hand, a number of empirical studies (Booth & Lee, 1995; Bottani, Monica, & Vignali, 2009; Hughes & Kornowa-Weichel, 2004; Ryerson & Whitlock, 2005; Salmon & Lenné, 2009) have focused on human errors in studying human factors that affect safety. For instance, Reason (1990) explained that human error is “a generic term to encompass that entire situation in which a series of planned expectations of mental or physical activities fails to achieve its intended outcome, and when these failures cannot be attributed to the intervention of some chance agency” (Reason, 1990, p.393). He further elaborated that human error can be classified into three. The first type is human mistakes. A mistake is a planning error where actions go as planned, but the plan is not good enough or fails. Mistakes facilitate learning. Moreover, mistakes can either be a failure of expertise or a lack of expertise. The third category of classification is a slip. This failure can be the result of the poor execution of a good plan. Furthermore, Dekker (2002) has eloquently stated that “human error is not an explanation for failure, but instead demands an explanation” (p. 372).

Peterson (1992) and Heinrich, Peterson and Roos (1980) stated that an accident can be tracked by its causes, such as human errors. The researchers found that an accident is a form of human error, which may be conscious or unconscious and may be based on some type of logic. Wiegmann and Shappell (2001) of the US aviation industry found that 70%

to 80 % of human error repeatedly referred to pilot error. However, a well-established fact is that accidents cannot be attributed to a single cause, or in most instances, to a single individual.

The behavioral factors of safety refer to employee motivation and performance improvement through behavioral constrains (Cox, Jones, & Rycraft, 2004). Behavior-based safety refers to behavior that leads to the reduction of risk behavior, thus resulting in the reduction of accidents and injuries (Krause, Seymour, & Sloat, 1999). Additionally, behavioral factors based on safety provide more focus on the behavior rather than results, such as accidents recorded.

According to Krause, Hidley, and Hodson (1996), workers with riskier behavior are commonly present in most situations involving accidents and injuries. When a behavior-related accident or injury is recorded, a similar attitude is highly likely to have caused an injury when previously experienced. Behavior-based safety involvement refers to a condition wherein more emphasis is placed on the group observation of workers performing regular work. The promotion of safety-oriented programs not only positively affects workers' behavior, but also encourages them to perform their tasks safely (Cooper, Phillips, Sutherland, & Makin, 1994; Maiti & Paul, 2007).

The individual and social factors are the aspect of risk which depends on the motivation to encounter risk, or avoid risk altogether, and it is one of the influential determinant of safety which is related to behavior (Powell, 2007). Risk can be perceived base on the influenced by some biased and other factors that influence behavior options. The term bias is explained as a process of influence that tends to produce results that systematically varies from reality (Shannon, 1999).

The risk which deals with the safe and unsafe practices depends on the cognitive biases associated with safety and for the workers who are facing risk, bias in the perception of risk which occur in a rational but this assessment of risk is unrealistic, in a result causing more higher level of risk (Powell, 2007) and higher levels of accidents and injuries casing death. Cognitive biases included melioration bias, rare event bias and optimism bias. The other factors that can influence the behavioral choices can include the cost factor of the safe behaviors and the unbalance between the demands for safety and the demands for performance. Melioration bias is the capability of individual to assign more weigh to short term results, and to underestimate the potential for the occurrence of any uncertain event (Luria, 2008; Zohar & Luria 2004).

Psychological factors are defined as internal psychological or mental aspects that have direct effects on the actions of workers toward safety issues (Geller, 2000). According to DeJoy, Schaffe and Wilson, (2004) psychological factors refer to “the psychological attachment of employees to the safety precautions of the organization, the value placed on affiliation with the organization, and the extent to which they are willing to extend the application of safety in the workplace” (p.88). In this context, the workers’ psychological state is a significant factor in safety performance.

According to Sawacha *et al.* (1999), the psychological state of a worker is very complicated and depends on the supervisor, one who the worker perceives as respectable and whose actions reflect the company's policies on safety. When the workers observe that their supervisor regards safety with equal importance as production, positive reactions can be expected, thus ensuring work safety. Sawacha *et al.* (1999) found psychological factor was to have a significant relationship with safety performance. Operatives who showed concern for personal safety had better safety records than those who neglected safety in the course of their work. Other researchers also found similar results (Burke *et al.*, 2002; Clissold, 2004; Koys & DeCotiis, 1991; Ward, 2001).

In summary, the aforementioned studies found human factors affecting safety performance. Additionally, human factors were revealed to play a vital role in the success of safety performance and the prevention of accidents and injuries in the workplace.

2.4 THE ROLE OF MANAGEMENT PRACTICES IN SAFETY PERFORMANCE

In the present study management practices is examined as an antecedent to safety performance. Workplace safety is explained by technological factors, system factors and human factors (Bellamy, 2010; Cooper & Phillips, 2004; Goetsch, 2011). Among these human factors are the highest contributors (Bottani *et al.*, 2009; Cigularov *et al.*, 2010; Fahlbruch, 2010). Human factors can be either viewed from the employee or employers. This study is underpinning by social exchange which explains the reciprocity among management and employee (Michael *et al.*, 2006; Neal & Griffin, 2006; Subramaniam, 2004; Wayne *et al.*, 2002). Among the common employer related factor examining an employee's performance is management practices (Vinodkumar & Bhasi, 2010; Vredenburgh, 2002).

From the early 1880s to the 1950s, management practices can be traced through the classical and scientific schools, as well as the human relations school of management (Morden, 1996), which, were driven by the manufacturing industries during the Industrial Revolution (1850 to 1960) (Hope & Hope, 1997). The main contributors to the scientific schools, the classical and the human relations school of management were Frederick Taylor, Henri Fayol, Max Weber, and Lyndall Urwick (Crainer, 1996) and Henry Gantt, Frank and Lilian Gilbreth, and E. F. L. Brech (Morden, 1996). Essentially, these pioneers stressed on the adoption of scientific tools in providing a variety of core management principles and processes that remain in practice today, including the organizational hierarchical model, operational strategic model, and structured work practices (Watters, 2004). This chapter elaborates the definition of management practices and highlight empirical studies of the dimensions of management practices.

Management practices are defined as the most effective methods or techniques for achieving organizational goals through the optimum utilization of the organizations' resources (Dorji & Hadikusumo, 2006). Similar definition is provided by Skjerve (2008), who maintains that management practices involve effective methods or techniques designed to achieve the goals of the organization Management practices aim at developing, monitoring, and evaluating work aim to help employees efficiently perform their jobs and eradicate labor problems (Flynn, Schroeder, & Sakakibara, 1995). In the context of occupational safety and health management practices are expected to reduce casualty rates through proactive policies and measures (Gershon *et al.*, 2000). In this research, management practices are defined as procedures practiced by the management of an organization with the intention of improving safety and health standards and performance. In other words, these practices are utilized to reduce accidents and injuries.

In the present study, management practices comprise six dimensions, namely, safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation. These dimensions are relevant to improve the capabilities of employees in confront to accidents and injuries in the workplace and improve the safety performance **(**Ali *et al.*, 2009; Vredenburgh, 2002; Vinodkumar & Bhasi, 2010).The following section empirically examines these six management practices.

2.4.1 Safety Training

Training is very important for employees to remain updated in their occupation. Training contributes the most in explaining management practices geared toward the improvement of the performance of an employee (Poulston, 2008).Training generally refers to the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge related to specific useful skills (Cooper, 2000; Harris, Guthrie, Hobart, & Lundberg, 1995; Noe, Hollenbeck, Gerhart, & Wright, 2006; Ruwan, 2007). This view is in line with that of Osterman (1995), who argues that training leads to problem-solving skills of the employees. In sum, training programs help organizations in goal setting, goal-achievement and professional skills (Cabrera, Fernaud, & D´ıaz, 2007; Geller & Williams, 2001). Previous studies have also shown that training can result in positive work outcomes such as employee performance or productivity (e.g. Conti, 2005; Dearden Reed & Van Reenen, 2006; Ichniowski, Shaw, & Prennushi, 1997; Lee & Lee, 2007; Schaffner, 2001), low turnover (e.g. Akhtar, Ding, & Ge, 2008; Batt, 2002; Kundu & Kumar, 2006), and job satisfaction (Bhatti & Qureshi, , 2007; Ballot, Fakhfakh, & Taymaz, 2006; Bradley *et al.*, 2004).

In the context of safety and health, employee training depends on the nature of work, where it plays a significant role in the completion of a specific task (Young, Brelsford, & Wogalter, 1990). Safety training is defined "as knowledge of safety given to employees for them to work safely and with no danger to their wellbeing" (Abdullah *et al.*, 2009, p.56). On a similar note, Barling, Kelloway, and Iverson, (2003) contend that training makes it possible for employees to acquire greater competencies to enable them have control at their workplace, leading them to perform their jobs safely. In addition, training helps reduce hazards and improves the employees' ability to address uncertainties (D´ıaz–Cabrera, Hernandez–Fernaud, & Isla–DE´ıaz, 2007; Noe, 2005; Roughton, 1993).

As discussed by Cohen (1995), the level of perceived danger was found to increase in compliance to warnings and instructions. Therefore, all employees should be well trained to identify and react against the hazards associated with their workplace. In every organization, occupational safety and health programme is the key to the successful accident prevention program, hence such training improves employee's skills, knowledge and attitudes (Varonen & Mattila, 2000). Furthermore, to improve the level of safety and health among employees, organizations ought to establish a systematic, comprehensive safety and health training program for the newly employed staff, particularly during the induction training to help the new employees get familiar with safety, health, and quality systems (Cohen & Jensen, 1984). Carder and Ragan (2003) also support the argument and highlight that safety and health training is the major elements of an effective safety program.

Previous empirical examinations showed that a link exists between safety training and safety performance and that this link can reduce accident rates and address safety issues. For instance, Huang *et al.* (2006) conducted a study to examine the relationship between safety practices and safety performance in the construction industry in New Zealand. This study found a significant and positive relationship between safety training and safety performance.

A study by Vinodkumar and Bhasi (2010) investigated the effect of safety management practices on safety performance in Kerala, India. They found a significant and positive relationship between safety training and safety performance. Their results highlighted the need for safety training in the workforce. Their study also indicated that effective safety training programs impacted on worker skills, safety knowledge, and attitude toward safety. Moreover, effective safety training was found to have a strong correlation to improved injury rates. Lin and Mills (2001) found that clear policy statements and safety training were found to play an important role in reducing accident and injury rates. In the same vein, Farooqui, Arif and Rafeeqi (2008) conducted a study to examine safety performance in construction industry of Pakistan. Self-administered questionnaires were used to collect data from 27 sites. The study found training is important factor affect on safety performance. They recommended that construction workers receive proper job-related safety and health training and career development programs.

Sgourou, Katsakiori, Goutsos and Manatakis (2010) conducted a study to examine the relationship between practical characteristics and safety performance. The study found many activities related to the prevention of occupational injuries and ill health, including safety training. In the same vein, a study by Tinmannsvik and Hovden (2003) was that safety training had a positive effect on accident predictions. Similarly, Vredenburgh and Cohen (1995) found that the level of perceived danger increased compliance to warnings and instructions. They also revealed a significant positive relationship between reduced hazards and employee training. Other studies of (e.g. Cohen, Smith, & Cohen, 1975; Lee, 1998; Ostrom, Wilhelmsen, & Daplan, 1993; Smith, Cohen, Cohen, & Cleveland, 1978; Tinmannsvik & Hovden, 2003; Zohar, 1980) found that companies with lower accident rates were characterized by good safety training for employees. These studies also found that effective safety training was an important factor in accident prevention and occupational safety.

Vassie and Lucas (2001) assessed health and safety management within working groups in the UK manufacturing sector. They found a significant and positive relationship between training and safety management. This study also found that effective training led workers to feel a sense of belonging, thus making them more accountable for safety in their workplace. Similarly, findings obtained by Abdullah *et al.* (2009) indicated that safety training had a significant and positive relationship with safety satisfaction in public hospitals in Malaysia. Further research showed that employees who participated in safety training experienced fewer work-related injuries than those who did not receive safety training (Colligan & Cohen, 2003; Zacharatos *et al.*, 2005). Likewise, research conducted by Burke *et al.* (2002) showed a positive correlation between safety training and worker competence. Improved depth of knowledge improved the safe execution of tasks.

Arboleda, Morrow, Crum and Shelley (2003) conducted a study to examine the relationship between management practices and safety culture for the trucking industry in the US. The study included individual-level responses obtained from 113 drivers, 98 dispatchers, and 109 safety directors. The study used the safety performance data included in Safe Stat in an effort to realize variation in safety performance and practices. This study found that driver training was a significant predictor of safety culture perceptions for respondents. The study also found that training was one of the major contributors to the overall prediction of safety culture perceptions primarily because of drivers' opinions of their own training. Carolyn, Lehmann, Haight and Michael (2009) conducted a study to examine the relationship between safety training and risk tolerance among 53 workers in the surface mining industry in USA. The study found safety training is necessary for changing safety-related attitudes and behaviors. The study found also no relationship between the quantity of safety training and that workers tolerance for risk in workplace settings.

Burke et al, (2011) conducted a study to investigate how safety training and workplace hazards impact the development of safety knowledge and safety performance in USA. The study found training is considerably more effective in promoting safety knowledge and safety performance. The study found also methods of safety training are necessary to knowledge acquisition and improve safety performance. Similarly, Wadsworth and Smith (2009) conducted a study to examine the relationship between safety culture and safety performance in UK. The data were collected from 1,752 employees from manufacturing sector. The study found safety training is basic factor to face of occupational accidents and injuries and improve safety performance in workplace.

Griffin and Neal (2000) examined the effects of safety climate on safety performance in Australian. The study used survey data collected from 1,403 employees in manufacturing sector. The study showed that individuals who received safety-related training, familiar with organizational safety incentive systems, strictly follow proper safety protocol and having greater knowledge regarding appropriate safety behavior are more likely comply with safety policies.

Zacharatos *et al.* (2005) investigated the relationship between occupational safety and high-performance work systems. A total of 138 safety directors in human resource company participated in this study. They found a significant relationship between safety training and high performance. They also found that good training for workers could improve the level of occupational safety, thus high performance.

Enshassi *et al.* (2008) adopted both qualitative and quantitative approaches to investigated safety performance of subcontractors in the Palestinian construction industry. On the basis of qualitative study, 30 factors were identified as factors determinants of safety performance of subcontractors. On the other hand, for the quantitative method, 60 questionnaires were administered on the participants who were selected randomly to obtain data. All items in the questionnaire were assessed on 5-point Likert scale, ranging from 1 = strongly disagree to 5=strongly agree. They found a significant relationship between safety training and injury rates. The study recommended that construction workers should be given proper safety and health training. A similar result was also obtained by El-Mashaleh, Rababeh and Hyari (2010) conducted a study to examine benchmark safety performance of construction contractors in Jordan. The data were collected from 45 construction contractors. The study found safety training for employees is vital to improve safety performance. The study found also safety training is one of the five factors that lead to zero accident in organizations. Likewise, Chockalingam and Sornakumar (2011) conducted a study to examine the effective tool for improving the safety performance in Indian construction industry. The study found behavior-based safety training helps improve safety performance and decrease accidents and injuries in the workplace.

Chen and Jin (2011) conducted a study to determine the effect of safety management on safety performance in the USA construction industry. This study was based on a case study of an onsite safety management program launched by a general contractor. This study found the importance of training in the prevention of accidents in the future and the necessity of training new workers to reduce injury and accident rates at the workplace. Geldart *et al.* (2010) conducted a study to investigate organizational practices and workplace health and safety for manufacturing companies in Canada. This study used mail questionnaires sent to employees of 312 manufacturing firms in the province of Ontario, Canada. The study found evidence supporting the relationship between safety training and lower injury rates. Another study that revealed a similar relationship was conducted by Razuri *et al.* (2007), who evaluated the effectiveness of safety management practices and strategies in 60 construction projects in Chile. This study found that safety performance was influenced especially by orientation and specialized safety training for management. The study also demonstrated a significant and positive relationship between safety training and project injury rate.

Wu *et al.* (2007) investigated the effect of organizational and individual factors on safety climate in university and college laboratories. The study was conducted among employees of 100 universities and colleges in Taiwan using mailed, self-administered questionnaires. They found that employees were significantly affected by safety training and safety climate. Likewise, the finding of the study on manufacturing industries by Wu and Kang (2004) indicated that safety training had a significant effect on safety climate, apart from individual factors, such as gender, age, title, and accident experience. Wang (2002) conducted a study to investigate the effect of individual factors, including age, gender, work site title, experience of accident, and safety training on safety climate in telecommunication industries. The study found that location, gender, age, title, work site, experience of accident, and safety training had significant impact on the safety climate.

DePasquale and Geller (1999) conducted a study to examine the critical success factors for behavior-based safety in USA. Self-administered questionnaires were used to collect data from 701 employees from 20 organizations that had implemented a behavior-based safety. All items in the questionnaire were rated on 7-point likert scale, ranged from 1= strongly disagree, to 7= strongly agree. The study found training significantly related to employee involvement in behavior-based safety.

A study by O'Dea and Flin (2001) conducted a study to examine the relationship between managers' level of experience and safety attitudes and behavior, among of 200 off-shore Installation Managers from 157 offshore oil and gas installations in United Kingdom. The study showed that employees who were well trained had higher perception of the safety climate than those who are not well-trained. In the vein, Krouse and Hidley (1989) found that safety training leads to improvement in workers' safety behavior among employees in manufacturing and transportation industries. They further justified their finding that better safety behavior is more likely to promote the safety climate. Another study by Hayes, Perander, Smecko and Trask (1998) was conducted to measure perceptions on workplace safety. The findings of the study showed that workers who are highly experienced through safety training had a better safety perception regarding the workplace environment than those who are not well trained.

Wu *et al.* (2010) examined the effects of organizational and individual factors on safety performance among 465 employees of four colleges in central Taiwan using self-administered questionnaires. The researchers found significant effects between accident experience and safety training practice. In addition, the researchers found significant effects between safety equipment and safety training quality. In a different study by Lingard, Blismas and Wakefield (2005) who examined the effects of supervisory practices on group-level safety climate in the Australian construction industry, found a significant correlation between supervisory practices, such as safety training, and safety climates.

Oltedal and McArthur (2011) reported on practices in merchant shipping and identified a number of influencing factors. A total of 1,262 questionnaires were gathered from 76 vessels in Norway. The findings of the study revealed that that a better safety-related training, trust, safety-oriented ship management, open relationship among the crew performance of pro-active risk identification activities, and feedback on reported events were significant predictors of higher reporting frequency.

Vecchio-sadus (2007) conducted a study to examine the relationship between safety culture and effective communication in Australia. This study used case study to illustrate how an organization respond to a decrease in injury and accident. The study found training is a key factor for the success of the communication process during accidents and injuries. The study also indicated that effective training programs impacted on worker skills. On the same note, El-Mashaleh, Al-Smadi, Hyari and Rababeh (2010) conducted a study to examine safety management in the Jordanian construction industry. The data were collected from 70 general contractors, who are involved in all types of construction. The study found weakness of safety training lead of poor safety management and the high rate of injuries in the workplace.

Even though many scholars have found a significant effect on safety training on safety performance, as shown above, other scholars revealed a different set of results. For instance, Ali *et al.* (2009) focused on management practices in safety culture and their influence on workplace injuries in Malaysia. They did not find significant relationship exists between safety training and reduced rates of occupational accidents and injuries. Vredenburgh (2002) conducted a study to examine the degree to which safety training contributed to a safe work environment for hospital employees. This study demonstrated that training, in itself, was inadequate to reduce injury rates and organizations must focus on an integrated program to build the capacity of workers to cope with accidents and injuries in workplace.

In summary, safety training was generally found to be significantly related to safety performance, lower accident rates, safety issues, and employee performance.

2.4.2 Rewards

Rewards are defined as an honor given to an employee in terms of incentive, increment, or any other tangible or intangible thing to encourage positive attitude and to improve performance (Cabrera *et al.*, 2007).In addition, rewards and incentives motivate employees to complete their work to the fullest (Bentley & Haslam, 2001). Rewards can make a person feel better, which is a worthwhile outcome by itself. Furthermore, when rewards increase, an individual's self-esteem, personal control, or optimism improves, thus having beneficial indirect impact on desirable behavior (Geller, 2003). The delivery of a reward does matter more than the material consequence. Furthermore, rewards themselves are only means of recognizing the efforts of people for their special efforts, rather than considered as payoffs for performance (Bayo–Moriones & Huerta-Arribas, 2002). Rewards that can be physical in form of certificate of recognition, placards, and trophies among others that serves as a visual reminder of the recipient's extraordinary performance. Moreover, employees can share the joy of the rewards with co-workers and relatives by displaying it in a visible location in the office or by initiating a conversation about his or her personal accomplishments (Batt, 2002). Rewards can also enhance the recipient's commitment to organization as well as self-direction to live up to the expectation behind the reward (Meyer & Allen, 1997). Fey and Bjorkman (2001), Guest (2002), and Mendonca (2002) used expectancy theory as the basis of rewards and compensation, thus suggesting that employees are more likely to be motivated to perform when they are offered more benefits in exchange of exemplary work performance.

Many studies have found that rewards can enhance work-related outcomes such as employee performance (e.g. Banker & Lee, 1996; Kalleberg & Moody, 1994; Khan, 2010; Mathis & Jackson, 2004; Oluleye, 2010), creativity (e.g. Amabile, Hennessey, & Grossman, 1986; Baer *et al.*, 2003; Fairbank & Williams, 2001; Joussemet & Koestner, 1999). For instance, a study conducted by Tsai (2005) on managers and employees of

Taiwanese semiconductor companies found a significant positive relationship between rewards and employee performance.

Oluleye (2010) found that a reward given to employees in Guinness, Nigeria improved their performance. A reward policy has positive effects on individual employee behavior. In addition, the study found that non-financial rewards, such as training programs, symposia, and workshops, enhanced employee effectiveness. Similarly, Berndardin and Russell (1992), in a study among managers, concluded that compensation and reward planning is a fundamental dimension of effective management policies.

Within the context of safety, rewards have been one of the most significant factors that could motivate individuals to engage or refrain from safe behavior at work. Rewards systems also stimulate individuals to report accidents cases or any unsafe behavior that could lead to accident in the workplace (Thompson & Luthans, 1990). A reasonable and equitable reward system is needed to motivate individuals to engage or refrain from safe behavior at work (Eiff, 1999). The organizational structure must include the prevention of accidents, not punishment after the occurrence of an accident (Peavey, 1995). Additionally, one of the important components of an organization's safety culture is the way in which safe and unsafe behavior is assessed, as well as the consistency at which rewards or penalties are based upon these reward evaluation (Reason, 1990). Furthermore, rewards and incentives motivate employees to prevent hazards at the workplace. In essence, rewarding employees based on how they behave can lead to the achievement of desired consequences (Bennett & Gzirishvili, 2000).

Numerous studies in the literature have shown that rewards play a direct role in motivating employees to perform creatively (Eisenberger, 1992; Eisenberger & Rhoades, 2001). In an effort to encourage employee creativity, numerous organizational leaders use rewards and incentives to motivate their employees (Baer, Oldham, & Cummings 2003; Van Dijk & Van den Ende, 2002). Empirical research found that rewards help enhance safety performance. For instance, Vredenburgh (2002) found a significant positive relationship between rewards and injury rates for hospital employees in the US. The study further considered safety promotion policies and practice, and then empirically assessed these policies using such factors as rewards, promotion, and incentives for reporting hazards, hence creating awareness among employees. Similarly, Sawacha *et al.* (1999) conducted a study to examine the factors affecting safety performance on construction sites in the UK. They recommended that rather than paying productivity bonuses as an incentive for higher productivity without due regard for safety, safety bonuses should be paid instead because such bonuses combine productivity and safety performance as a goal for reward.

Abdul-Rashid, Bassioni, and Bawazeer (2007) examined the factors affecting safety performance in large construction contractors in Egypt. They found a positive relationship between rewards and safety performance. This study also found that rewards help management reinforce employee behavior to meet the requirements of safety and to prevent injuries and accidents. Another study that revealed a similar relationship was conducted by Collinson (1999), who focused on the safety and surveillance of North Sea oil installations. He found that rewards can motivate employees to report accidents, thus leading to improved safety performance under hazardous working conditions.

Gadd (2002) concluded that rewards can aid in the achievement of zero accidents by motivating employees to prevent accidents and by encouraging them to report the occurrence of such accidents immediately. On the same note, in a study examining the effect management practices on safety culture and on workplace injury conducted by Ali *et al.* (2009), a reward was found to be capable of reducing injury rates and accidents. Meanwhile, the 1982 report by the US Committee on Underground Coal Mine Safety confirmed that rewards motivate managers and employees to achieve safety performance goals at work.

Broadbent (2007) found evidence of the role of rewards in reducing the rates of occupational accidents and in improving safety performance when safety culture and employee participation were examined. Likewise, Howell, Ballard, Abdelhamid and Panagiotis (2000) found that rewards protected workers from exposure to occupational accidents in the workplace. Another study that was conducted by Wiegmann *et al.* (2002) found that rewards were important factors in the continuing success of organizations because they reflect the safety culture in the organizations.

In a study by Vinodkumar and Bhasi (2010), the direct influence of safety promotion policies on safety performance was found to be the result of encouragement and rewards. This study also found that safety promotion policies were very important because such policies had the capability to motivate employees with rewards and incentives to improve their safety performance. On a related study by Hagan, Montgomery and O'Reilly, (2001), the use of incentives was found to motivate employees to reduce accidents. Moreover, it is an accepted feature of both organizational behavior management and total quality management models.

In summary, a large number of studies indicate a positive relationship exists between rewards and safety performance or safety issues. A reward system helps management reinforce positive employee behavior and take notice of good work behavior.

2.4.3 Management Commitment

Management commitment is defined as administration's insistence on a commitment to safety programs and to the prevention of occupational accidents through employee training and management participation in safety committees and follow-up safety designs of work (Arboleda *et al.*, 2003). Management commitment to safety is a vital factor influencing the success of an organization's safety programs (Choudhry, Fang, & Ahmed, 2008). Furthermore, management commitment provides the background for exploring and differentiating safety practices to enhance safety performance (Garrett & Perry, 1996). In essence, management commitment is of major importance in organizations to improve and enhance workplace attitudes and behavior (Porter, Crampon & Smith 1976; Koch & Steers, 1978; Angle & Perry, 1981).

Management commitment to safety refers to the degree at which top management identifies safety as a guiding principle of the organization. Thus, management commitment to safety is concerned with the ability of top management to show a positive attitude toward safety even during fiscal austerity, as well as in the active promotion of safety in a consistent manner across all levels of the organization (Fleming, Flin, Mearns & Gordon, 1996). If top management is highly committed to safety issues, it may likely to provide sufficient resources to support development and implementation of safety activities (Eiff, 1999).

Management commitment also concerned with efforts put in place by top management to make sure that every aspect of operations, including selection, procedures, training, equipment and work schedules, are administratively evaluated and modified to improve safety if need be (Wiegmann *et al.*, 2002). Indeed, commitment of an organization's upper-level management has long been recognized to play a critical role in the promotion of an organizational safety culture (Dedobbeleer & Beland, 1998; Fleming *et al.*, 1996; Flin *et al.*, 2000; Meshkati, 1997; Yule, Flin, & Murdy, 2001; Zohar, 2000).

Previous empirical examinations have shown the existence of a link between management commitment and safety issues. For instance, Geldart *et al.* (2010) conducted a study to determine organizational practices and workplace health and safety in Canadian manufacturing companies. The data were collected from 312 manufacturing firms using mailed questionnaires. The result showed a significant influence of management commitment on injury occurrence at the workplace. Similarly, the study conducted by Zohar (1980) showed that management commitment to safety was a significant factor influencing organization's safety programs of industrial organizations in Israel.

In another research project conducted by Cox *et al.* (2004), the behavioral approaches to safety management in UK reactor plants were examined. The study adopted triangulation research approach to analyze the data. This study found a positive relationship between management commitment and behavioral safety in all levels within organizations. In a different study, Yule, Flin and Murdy (2007) examined the role of management and safety climate in preventing risk-taking at work among 1,023 employees of six conventional UK power stations. They found a positive relationship between management commitment and worker risk-taking in terms of improving the safety climate.

Smith *et al.* (1978) also carried out a study cross-section of 42 US industrial plants and found that perceived top management commitment to safety was significantly associated with lower accident rates. Similarly, Donald and Canter (1994), found that the number of safety climate scales and self-reported accident involvement, including management commitment were correlated among employees in UK chemical plants. In a related study by Diaz and Cabrera (1997), safety climate and attitude were employed as evaluation measures of organizational safety in a sample of Spanish airport workers. The findings of the study revealed that perceived company safety policies (including management commitment) were significant factors influencing organizational safety. Likewise, Rundmo (1994) conducted a study to examine the relationship contingency measures and occupational accidents on offshore petroleum platforms. The findings of the study showed that perceived top management commitment to safety was significant predictor of safety-related contingency measures and employee satisfaction.

A study by Cheyne, Tomas, Cox, and Oliver (1999) modeled employee attitudes on safety in UK industries. They found that management commitment to safety was the top priority in most industries. Moreover, a study conducted by Vinodkumar and Bhasi (2010) established a significant relationship between perceived management commitment and safety performance.

Miozza and Wyld (2002) examined the perspective of American safety professionals on behavior- and incentive-based protection programs. They found that the success of behavior-based safety in reducing injuries needs the commitment and involvement of each level of management. Likewise, Michael, Guo, Wiedenbeck and Ray (2006) conducted a study to examine the impacts on subordinates' safety outcomes in wood product manufacturing facilities. They found that the strong support and commitment of each level of management on safety drove employees to reciprocate the deeds by demonstrating safe behavior at the workplace.

Another study conducted by Zohar (2002) in examining supervisory practices for improving safety performance showed that management commitment played a vital role in improving safety performance and in reducing accidents. On the same note, Ali *et al.*

(2009) found that management commitment could reduce the occurrence of injuries and accidents.

A study was conducted by O'Toole (2002) conducted a study to investigate the relationship between employee perceptions of safety and organizational culture among employees in mining and construction firms. This study found that management commitment to safety influence employee perception toward safety issues. Mahmood *et al.* (2009) conducted a study to examine the role of safety commitment. This study aimed to show the crucial role of employee safety commitment in safety culture development, as reflected in employees' behavior. This study used self-administered questionnaires distributed to 663 employees in the Malaysian petro-chemical industries. This study found that safety commitment had a significant positive relationship with employee safety behavior at the workplace. The researchers also found a number of differences in terms of employee safety commitment based on educational achievement, level of management, and seniority, but found no difference with regard to gender.

Michael, Evans, Jansen, and Haight (2005) examined management commitment to safety as an organizational support and its relationship with non-safety outcomes in wood manufacturing employees in US. Questionnaires were used to collect data from 641 production employees at three wood product companies. The results suggested that employee outcomes differed based on perceptions of management's commitment to safety. This study also found that management commitment to safety was positively related to management commitment and negatively related to employee withdrawal.

Cooper (1998) demonstrated that management commitment played an important role in the safety change process and in safety auditing. In a related study, Diaz and Cabrera (1997) cited some findings that showed that low-accident companies should have management safety commitment, safety training, and selection procedures. Clarke (1998) conducted a study to determine organizational factors affecting the accident reports of train drivers. This study found that in railways, the manager's safety commitment influenced the employee's perception of safety practice. Meanwhile, Reason (1990), from a socially engineered perspective, claimed that commitment is the driving force behind organizational safety. A related study was conducted by Dedobbeleer and Beland (1991), who examined the safety climate in construction sites. This study found two important factors that should be included in safety surveys, namely, management safety commitment and employee involvement.

Seo (2005) conducted a study to examine the mediating role of perceived risk, perceived work pressure and perceived barriers on the relationship between perceived safety climate and safety behavior among 722 employees from grain industry in the United States. The structural equation modeling (SEM) was used to analyze the data. The paths of the SEM showed that perceived safety climate was the most significant predictor of unsafe work behavior. The results further revealed that perceived risk, perceived work pressure and perceived barriers, mediated the relationship between perceived safety climate and safety behavior.

Jeffcott, Pidgeon, Weyman and Walls (2006) conducted a study to examine the relationship between risk, trust, and safety culture among 500 employees in train operating companies in UK. This study employed quantitative approach. The study found three important factors in the safety issue namely (flexibility, management commitment, and learning).

In summary, management commitment revealed positive results when associated with safety issues, both specifically and generally. Management commitment often helps improve safety performance and prevent accidents and injuries because it raises the degree of readiness and alerts management to safety risks in an organization. On this basis, a positive relationship theoretically exists between management commitment and safety performance.

2.4.4 Communication and Feedback

Communication and feedback are defined as key factors in the provision of information and data on the safety level of organizations. Managers use communication and feedback to determine the degree of risk caused by accidents at work (Kletz, 1993). Additionally, communication and feedback influence the performance of employees in organizations (Arboleda *et al.*, 2003; Bentley & Haslam, 2001). In other words, communication plays a central role in the success of organizations and individuals particularly in terms of the completion of their work and the achievement of their desired goals (Eshraghi & Salehi, 2010). The role of feedback is critical in explaining worker performance because employee behavior depends on new occurrences, such as updated information on hazards and threats. Consequently, efficient communication and feedback help management track errors at work and correct deviations as soon as possible (Pandey & Garnett, 2006).

Previous research works have revealed empirically the importance of communication and feedback in enhancing job performance (e.g. Cabrera *et al.*, 2007; Collins & Clark 2003; Clampitt & Downs, 1993; Pettit, Goris, & Vaught, 1997; Pincus, 1986) in various research settings such as in hospitals (Jain, 1973; Pincus, 1986), small businesses (Pearce & Porter, 1986), and physical education offices (Eshraghi&Salehi,2010).

Within the context of safety, Vinodkumar and Bhasi (2010) argued that regular communication about safety issues among management, supervisors, and the workforce is an effective management practice for the improvement of safety in the workplace. In a similar vein, Lee (1998) listed communication among his nine characteristics of low-accident plants, and communication thus emerged as an important factor in the success of safety programs. Meanwhile, Havold and Nesset (2008) explained communication as “the extent to which organization provided an effective information exchange regarding internal safety matters” (p. 315).

Previous empirical examinations have indicated the existence of a link between communication and feedback, and safety issues. For instance, Cigularov, Chen and Rosecrance (2010) conducted a study on error-management climate and safety, as well as on the role of communication in safety performance, in the US construction industry among 235 employees in construction firms Midwest and Northwest regions. Results revealed the significant positive relationship between safety communication, error-management climate and safety behavior. The study also further showed that safety communication and management climate explained safety performance among the sample studied.

Cheyne *et al.* (1998) investigated the role of safety climate in the prediction of levels of safety activity. They discovered a positive relationship between safety communication and safety performance, including safety compliance and safety participation. In a related study, Griffin and Neal (2000) examined safety climate and safety performance in seven Australian manufacturing companies. The result of the study signified that safety communication was significantly associated with safety behavior. Parker, Axtell and Turner (2001) conducted a study to design a safer workplace and to facilitate better communication among supervisors. They learned that a significant and positive relationship existed between communication and safety performance. Similarly, Probst (2004), in his study on safety and insecurity, noted that safety communication was significantly associated with safety knowledge.

Mohamed (2002) showed the importance of the role of communication in achieving a positive safety climate and safe work behavior in construction sites in Australia. Similarly, DeJoy, Schaffer, and Wilson (2004) assessed the determinants and the role of safety climate. Data were collected from questionnaires given to 2,208 employees of a large national retail chain in 21 different locations in the US. This study found significant relationship between safety policies and communication as a dimension of safety climate.

Bentley and Haslam, (2001) analyzed the similarities of safety practices used by managers to determine high and low accident rates in postal delivery offices in UK. Data were collected from interviews with 20 delivery office managers. The study revealed that safety communication was positively related to low accident rate.

Probst and Estrada (2010) investigated the under-reporting of accidents among employees. Data were collected from questionnaires administered to 425 employees employed in five industries with above-average risk for employee injuries in the US. This study revealed the very important role of safety communication in the reporting of accidents. Furthermore, Ali *et al.* (2009) learned that communication and feedback were significantly related to the rates of injury in the industrial sector in Malaysia.

Zohar (2002) studied the methods by which to modify supervisory practices with the aim of improving sub-unit safety. He found the important role of communication in the improvement of sub-unit safety. In other words, a positive relationship was found to exist between communication and safety. Likewise, Neal *et al.* (2000) studied the effects of general organizational climate on safety climate and safety performance in Australia. They illustrated the positive connection between safety communication and safety behavior.

Vecchio-sadus (2007) conducted a study to examine the relationship between safety culture and effective communication in Australia. This study used case study to illustrate how an organization respond to a decrease in injury and accident. The study found positive relationship between safety culture and communication. The study also found communication is important factor effect on safety level in organizational. In a similar study, Hofmann and Stetzer (1998) conducted a study to examine the role of safety climate and communication on accident interpretation in USA. The data were collected from 1,359 workers from manufacturing sector. The study found safety climate and safety communication had influence on accidents and injuries in workplaces.

Harvey et al, (2002) conducted a study to investigate the components of safety culture and how it varies in a highly-regulated nuclear power plant. Self-administered questionnaires were used to collect data from 1550 employees at two plants in the UK nuclear industry with response rate of 64.7%. The study found communication vital factor influence on safety in organizational. In a similar study, Biggs, Dingsdag, Kirk and Cipolla (2009) conducted a study to examine the relationship between safety effectiveness and safety culture in Australian construction industry. This study employed both qualitative and quantitative approaches. Qualitatively, 70 interviews with managing directors and construction site managers. The study found communication had a positive impact on safety culture.

Abdullah *et al.* (2009) conducted a study to develop a measure of attitudes and perceptions of safety that are related to safety climate in the workplace. The data were collected from questionnaires administered to 372 employees from three state hospitals in the northern region of Malaysia with response rate of 38.4%. This study found the negative correlation between safety incidents and safety communication.

Ng, Cheng and Skitmore (2005) conducted a study to evaluate the safety performance of 129 main contractors and sub-contractors in Australia using self-administered questionnaires with a response rate of 72%. This study found the communication important factor to improve safety performance in construction industry.

Vredenburgh (2002) found a positive link between communication and feedback and injury rates. In a different study, Wu *et al.* (2008) also conducted a study to examine the relationship among safety leadership, safety climate and safety performance. Data were collected from questionnaires administered to samples from four universities in central Taiwan. They found a positive effect of safety communication on safety performance. Cox and Cheyne (2000) assessed the safety culture in offshore environments in UK. This study included communication and feedback obtained from survey questionnaires answered by various categories of workers. The study confirmed that safety performance was influenced by the level of communication in an organization.

While the above studies have shown that communication affects safety performance, other researchers demonstrated negative relationship between safety communication and occupational accidents and injuries. For example, Hofmann and Morgeson (1999) examined safety-related behavior as a social exchange and examined the role of perceived organizational support. Data were collected from 49 supervisor-group-leader dyads in a manufacturing facility in Texas. They observed a negative relationship between safety communication and occupational accidents. The results indicated that perceived organizational support is significantly related to safety communication. In their study on the measurement of safety climate on offshore installations, Mearns, Flin, Gordon, and Fleming (1998) found a negative relationship between safety communication and occupational accidents among 722 UK offshore workers from a range of occupations. Similar result was also reported by Mearns, Whitaker and Flin (2003), who observed a negative relationship between safety communication and occupational accidents in 13 offshore oil and gas installations in UK. Probst (2004), Sawacha *et al.* (1999), and Siu *et al.* (2004) also demonstrated a negative relationship between safety communication and occupational accidents, suggesting that lack of safety communication tend to increase the rate of occupational accidents.

In summary, communication and feedback are related to safety performance and job performance, as illustrated by numerous studies, suggesting that communication and feedback are important factors that influence the issue of safety in organizations and the prevention of occupational accidents and injuries.

2.4.5 Hiring Practices

Hiring practices refer to the process of developing criteria for hiring employees. Hiring practices ensure that the right people are selected for the right position (Turner, 1991). Looking for the most appropriate talent for any particular position so that they could fit in a specific organizational culture and climate is expected in the practice of recruitment. This practice is meant to decrease the cost of recruitment by efficiently identifying the employees' education, training, and development (Vlachos, 2009). Additionally, hiring is also associated with the process of bringing in people who have operational expertise and who can contribute to the organization's competitive advantage (Paelmke, 2007).

A standardized procedure for selecting and recruiting qualified candidate for an open job position, need to be followed and the outcomes of this process need to be communicated to the concerned candidates (Paul & Anantharaman, 2003). Cho, Woods, Jang and Erdem (2006) contended that human resources manager or any person who has been assigned to work on his behalf should be responsible for outsourcing, selection and recruitment process so as to establish the recruitment and selection policy. Schuster (1986) argued that selective hiring is a key practice that contributes to the achievement of the organizations' goals. Vlachos (2009) examined the effects of human resource practices (i.e. job security, decentralization of decision making, training and development and compensation policy, among others) on performance among food managers in Greece. The study found a positive relationship between all the human resource practices factors and performance. A related study by Collins and Clark (2003) further explained that good hiring practices improve workplace productivity and employee performance.

A study by Zhn *et al.* (2004) on industrial enterprises in China illustrated that the country's hiring practices influenced the changing business environment. The results confirmed the significant relationship between China's hiring practices and the changing business environment. The changing business environment required that adjustments be made in the economic, technological, social, and cultural aspects of the business. Likewise, Huselid (1995) conducted a study to investigate the effects of high performance work Practices and firm performance. Three thousand five hundred and two public quoted firms in US were included in the survey. The findings of the study revealed high performance work hiring practices were economically and statistically related with firm performance (i.e. turnover and productivity).

In the context of safety, hiring practices include the selection of personnel who have the ability to understand and to create awareness of the safety process and its importance in the organization (Eckhardt, 1996). Hussain (2009) examined the factors that contributed to the successful implementation of occupational safety in the manufacturing sector in Malaysia. He used a questionnaire to collect data from 150 employees. He learned that the hiring practices were responsible for safety achievements. Similarly, Vredenburgh (2002) studied the management practices and the reduced rate of injuries in hospitals. He discovered a significant positive correlation between hiring practices and reduction in the rates of injury.

Ali *et al.* (2009) also scrutinized the safety culture in Malaysian companies. However, they failed to find any significant correlation between reduced rates of injury and the hiring practices. They suggested that the result could be attributed to the poor hiring practices Malaysian companies have.

In summary, hiring practices could play an important role in organizations. Even though previous studies on the effect of hiring practices and safety performance in particular are limited, many studies have indicated that hiring practices can make a difference in job and employee performance. In other words, hiring the right people for the right job can enhance workplace activities.

2.4.6 Employees Participation

Employee participation is defined as the participation of employees or employees' involvement. Employee participation is a phenomenon that deals with a behavior-oriented technique that gathers workers, individuals, groups, or teams in the upward communication flow and in the decision-making process within the organizational chart (Khan, 2010; Vinodkumar & Bhasi, 2010). From a management perspective, employee participation refers to the ability of employees to influence the management or the work process directly in an enterprise (Juan & Andrew, 1978). Thus, employees can influence management decision making at various hierarchical levels in an organization (Hem, 1980).

Employee participation is important in organizations as it plays a role in achieving organizational success. Empirical studies examining the influence of employee participation on employee performance have been extensively conducted (Goetsch, 2002). For example, Marwat,Qureshi and Ramay (2007) conducted a study on the telecommunication sector in Islamabad to scrutinize the relationship between employee participation and employee performance. The results indicated that employee participation had a positive correlation with employee performance. Similar results that employee participation affected favorably employee performance were also reported elsewhere (e.g. Collins, Ericksen, & Allen, 2005; Huselid, 1995; Qureshi & Ramay, 2006; Singh, 2005; Patterson, West, Lawthom, & Nickell, 1997; Zheng, Salganik, & Gelman, 2006).

Employee participation was also observed to affect other work-related outcomes such as increased commitment and a higher level of production of employees at the workplace (Summers & Hyman, 2005), employee output at work (Ichniowski and Shaw, 1995), job commitment and job satisfaction (e.g. Edkins, 1998; Gunawan, 2006; James & Walters, 2002), and improved employee trustworthiness (Lawler, 1975; Johnson & Johansson, 1991).

From the perspective of occupational safety, employee participation may be defined as the willingness of employees to accept responsibility in creating an accident free workplace (Geldart, Shannon & Lohfeld, 2005). This responsibility is perceived as willingness of employees to actively partake in all activities that support the learning process and stimulates mutual support and co-operation among employees (Topf, 2001). In addition, this responsibility can only be successfully exercised given supportive organizational climate. Hence, employee's participation is a process that requires behavior that is dynamic and action-oriented, as well as involves problem solving for the continuous advancement toward a safety-conscious environment (Shearn, 2004). In other words, employee participation refers to the extent to which employees are fully involve in safety decisions, allowed to initiate and achieve safety improvement, accountable for their actions, and also take pride in the safety performance record in their workplace (Seligman, 1991).

Employee participation is based on the employees' interest in a certain job (Shearn, 2004). The amount of participation can be categorized from no participation, where managers, supervisors, or other central authority make decisions, to complete participation, where all individuals are involved in decision making (Vredenburgh, 2002). When the employees are involved in making decisions, they provide suggestions and feedback on internal and external improvements. According to Wiegmann *et al.* (2002), the participation of employees in safety is reflected in their eagerness to contribute ideas during safety seminars and training. Employees also demonstrate their participation through their active adherence to safety operations, their ability to understand the risks involved in everyday operations, and their willingness to express their concerns regarding safety issues, both up and down the organizational hierarchy.

Previous empirical examinations have demonstrated the existence of a link between employee participation and safety issues. For instance, previous studies (e.g. Cohen, 1977; Cohen, Smith,& Cohen, 1975; DePasquale & Geller, 1999; Griffiths, 1985; Harper *et al.*, 1997; Shafai–Sahrai, 1971; Shannon, Mayr & Haines,1997; Smith *et al.*, 1975) revealed that organizations with lower accident rates are more likely to be beneficiaries of managerial styles and incentives such as management appreciation of employee participation in training for new employees, daily communication, safety activities, and frequent training for existing employees between workers and supervisors about health and safety. Apparently, these studies showed a significant and positive connection between lower accident rates and employee participation.

Lee (1998) focused on the assessment of safety culture in the Sellafield site of British nuclear fuels in Cambria. Data were gathered from self-administered questionnaire from 5,296 participants. The questionnaire covered numerous domains of safety, such as job satisfaction, safety rules, training, risks, safety procedures, and employee participation. The findings confirmed that employee participation was a decisive factor in safety management in organizations.

Ali *et al.* (2009) revealed that employee participation was positively related to injury rates in industrial zones in Malaysia. This study confirms that employee participation in the decision-making, accidents and injuries could be reduced. Similar result was also reported by Johnstone, Quinlan, and Walters (2005), who managed to provide evidence of the positive benefits of employee participation on occupational safety at the workplace. A parallel study by Vinodkumar and Bhasi (2010) showed that workers' involvement in safety had a significant and direct relationship with safety performance for industrial units in India.

Results of the study conducted by Gevers (1983) strengthened the arguments in favor of employee participation in workplace safety. Employees were found to contribute to the prevention of industrial accidents by being vigilant about potential accidents. Industrial accidents can also be avoided if the employers regard the ideas and experiences of employees as useful contributions to the definition and solution of safety problems. More importantly, Gevers stated that cooperation between the employer and employees is essential in improving the working conditions in the company. Similarly, Vredenburgh

(2002) found a significant relationship between the participation of workers and the rate of reduction of injuries in the US.

Cheyne *et al.* (2002) conducted a study to investigate relationships between organizational safety climate, perceived physical work environment and perceived workplace hazards and relates levels of safety activity among 708 employees from a large manufacturing firm in UK. The findings of the study revealed that conducive working environment and employee participation were significant predictors of safety activities

In another study, Carder and Ragan (2003) included 6,000 employees from a variety of plants in USA. This study concentrated on the analysis of safety measurement in chemical companies. The study found that that employee participation helped improve the safety performance of companies. Likewise, Clarke (1982) conducted a study to examine workers' participation in health and safety in Canada. Results of the study revealed that there was significant positive relationship between worker participation and prevention of industrial accidents.

In a related study, Walters (1998) conducted a study to examine the relationship between employee participation in health and safety activities among employees in agricultural sector in the UK. The results of the study revealed that most of the clear reasons for the achievement of worker participation in safety and health is the experience and commitment of employees to organization. The study further showed that all participants had many years of employment in the agriculture sector, which enabled them to be highly identified with the hazards and infringements of safety standards.

Still in connection with employee participation, Singleton (1983) investigated occupational safety and health systems. This study found that employee participation in safety issues was an essential factor in lowering the rates of occupational injuries and accidents in the workplace. The expertise of employees and the amount of information available to them accounted for their ability to improve working conditions and to make appropriate decisions. Singleton also found a significant positive link between employee participation and lower injury rate.

Rooney (1992) found a significant positive relationship between employee participation in decision making and in creating a safer workplace. Rooney also learned the importance of involving the employees in the actual designing and implementation of organizational plans and policies. In their research project on occupational health and safety management in the Norwegian oil and gas industry.

Shannon *et al.* (1996) examined workplace organizational correlates. Data were collected from questionnaires sent by mail to companies under six types of industries, including metal articles, plastic articles, grain products, textile manufacturing, printing, and automobile manufacturing. The researchers' scholars found that increasing participation of workers in safety issues resulted in a low rate of accidents and occupational injuries at the workplace. Likewise, Costella, Saurin, and Guimaraes (2009) conducted a study to examine a method of assessing health and safety management system used by automobile manufacturers in Brazil. Costella *et al.* found that the participation of workers in safety issues was essential in maintaining a work environment that is free from occupational accidents. Another study on employee participation in safety programs was conducted by DeJoy (1996) to determine the effect of more open and informal communication on employees. His major aim was to address safety problems as soon as possible and to reduce occupational accidents in the workplace. This study found that employee participation in safety issues was an important factor in lowering the rates of occupational injuries and accidents in the workplace.

In summary, the aforementioned literatures found that employee participation had a positive relationship with safety issues and employee performance. The effects of employee participation on safety issues can theoretically improve safety performance and reduce occupational injuries and accidents in the workplace.

2.5 EMPIRICAL STUDIES ON LEADERSHIP STYLES

Leadership is an individual's ability to influence the behavior of others toward the achievement of the goals of the organization (Judge, Bono, Ilies, & Gerhardt, 2002). Manning (2002) defines leadership "as the process of unifying the disparate motives, desires, and efforts of members around a single philosophy, agreed mission, vision statement, and mutual set of common values or consensus purposes" (p.218). In a similar vein, Bernhard and Walsh (1995) define leadership as the process of leading a group to attain achievement. Chen and Silverthorne (2005) affirm that the term leadership refers to "the collective activities of organizational members to achieve the mutual task of setting direction, building commitment, and creating alignment" (p.284). Pasa, Kabasakal, and Bodur (2001) define leadership "as an individual's ability to influence, motivate, and enable others to drive the success of organizations" (p.565). According to Van Vugt and De Cremer (2002), leadership refers to both leaders and followers who fulfill certain objectives to meet the needs, aspirations, and the satisfaction of all members.

Previous studies evidenced that leadership styles have a significant influence on work-related outcomes in various research settings such as employee behavior and performance (e.g. Abbas & Yaqoob, 2009; Bono & Judge, 2003; Lu & Yang, 2010; Pater, 2004; Purvanova, Bono, & Dzieweczynski, 2006; Yang *et al.*, 2010; Yukl, 2006), job satisfaction (Ababneh, 2009; Al-Hussami, 2008; Bartolo & Furlonger, 2000; Bartram & Casimir, 2007; Jabnoun & Al-Rasasi, 2005; Leary, Sullivan, &McCartney, 2004; Lok& Crawford, 2004;Naidoo, 2008), job involvement (Mester, Visser, & Roodt, 2006), organizational citizenship behavior (Asgari, Silong, Ahmad, & Abu-Sama, 2008), organizational innovation (Rao, Manohar & Mellam,2008), organizational justice (Ismail *et al.*, 2010), psychological empowerment and service innovation (Yang & Wei, 2009), and organizational commitment (Walumbwa, Wang, Lawler, & Shi,2004), indicating the important role of leadership to the success of the organization.

Leadership styles are varied and can be categorized into: transactional and transformational leadership styles, task-oriented style autocratic style, charismatic style, democratic style, laissez-faire style, people-oriented style, bureaucratic styles, servant, (Burns, 1978; George, 2000; Kelloway, Mullen, & Francis, 2006; Raja & Palanichamy, 2011; Stordeur, D’hoore, & Vandenberghe, 2001). The present study adopted two leadership styles, namely, transformational and transactional leadership, widely used to measure leadership styles (Adamshick, 2007; Dunham & Klafehn, 1990; Hater & Bass, 1988; Howell & Avolio, 1993; Reid, Flin, & Mearns, 2008; Waldman, Bass, & Yammarino, 1990).

Transformational leadership is the type of leadership that “occurs when one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality” (Burns, 1978, p.20). Similarly, transformational leadership coordinates leaders and followers in a collective way for the mutual process of supporting one another morally (Burns, 1978; Adamshick, 2007). Transformational leaders rise from the ranks by attracting or appealing to the higher ideals and values of followers. In addition, transformational leadership is attained when leaders promote acceptance and awareness of the reasons and the tasks of the group and then motivate workers to look beyond their own self-interest for the good of the followers (Bromley & Krischner–Bromley, 2007).

Transformational leadership is explained as the “process that facilitates major changes in attitudes and assumptions of organizational members and builds commitment for the organization’s mission and objectives” (Yukl, 1998, P.78). Additionally, transformational leaders have the talent to motivate their followers or subordinates to commit themselves to perform beyond expectations (Bass, 1990; Bryman, 1992; Howell & Avolio, 1992).

These leaders make sure that followers know the importance of sharing organizational goals and values (Burns, 1978).

On the other hand, transactional leadership is defined as the daily transaction between leaders and followers (Pater, 2004). In addition, transactional leadership refers to the situation whereby a person initiated a contact with others, in order to exchange valuable things (Burns, 1978). In other words, transactional leadership is explained as “those employees’ behaviors which are related to monitoring and rewarding” (Reid, Flin, & Mearns, 2008, p.4).Transactional leaders refer to a leader who identifies and clarifies job tasks for the followers and also communicate on how to successful execute of these tasks (Bass, 1990). In addition, transactional leaders evaluate and explain their goals to their subordinates and make suggestions on how to operate tasks. Based on previous studies, transactional leadership could have a favorable influence on the attitudinal and behavioral responses of employees (Bass, 1990; Zagoršek, Dimovski, & Škerlavaj, 2009).

In essence, while the transactional leadership style deals with rewards and monitoring systems, while, transformational leadership behavior is concerned with inspiring and genuinely motivating the followers to perform better in the workplace (Reid *et al.*, 2008).

Previous studies have examined the relationship between leadership and safety performance (e.g. Flin & Yule, 2004; Kivimaki, Kalimo, & Salminen, 1995; Lee, 2002; Pater, 2001; Wu *et al.*, 2008; Zohar, 2003). For example, Lee (2002) found that organizational culture, leadership, and organizational vision are some of the critical factors that affect safety performance. Similarly, Zohar (2003) showed the ways by which leaders motivate workers to get involved and the ways by which system implementation could enhance employees' desire to improve safety performance. On a similar note, Wu et al (2008) findings demonstrate that organizational leadership would perform better to develop and to encourage through a strategy that the management could utilize to enhance safety performance.

Another study conducted by Mullen, Kelloway and Teed (2011) conducted a study to examine the relationship between leadership and safety performance (safety compliance and safety participation) in two samples in Canada. Self-administered questionnaires were used to collect data from 241 young employees and again in a sample of 491 long-term health care employees. The findings of the study revealed that leadership was significantly associated with greater safety compliance as well as safety participation in employees.

While leadership in general has been examined in relation to safety performance, studies on the influence of transformational leadership on safety are on the rise, indicating the growing importance of this leadership style in enhancing safety culture and performance at work. In fact, as recommended by a number of scholars (e.g. Akson & Hadikusumo, 2007; Johnson, 2007; Rundmo & Hale, 2003; Wu *et al.*, 2008), such influence is worth studying. For example, Schutte (2010) conducted a study to examine safety performance in the construction sector in the Netherlands. This study aimed to shed light on the relationships among transformational leadership, safety climate, and safety performance (compliance with safety behavior and safety participation). This study revealed that transformational leadership was positively related to safety participation but not to compliance with safety behavior. Similar result was also reported by Inness, Turner, Barling, and Stride (2010) conducted a study to examine transformational leadership and safety performance (compliance with safety behavior and safety participation) in Syracuse University in the US. Transformational leadership was measured using four items from the "Multifactor Leadership Questionnaire" (Bass & Avolio, 1995). They found transformational leadership to be unrelated to compliance with safety behavior but positively related to safety participation.

Other studies have showed the significant effect of transformational leadership and safety performance. For instance, Idrus, Abdul Wahab, Mat Shah, and Rees (2009) performed a study on transformational leadership and safety performance in a manufacturing company in Malaysia among 50 production employees. They found that transformational leadership had a strong and positive relationship with safety performance. Similar finding was reported by Wu *et al.* (2008), who demonstrated a correlation among leadership, safety climate, and safety performance in Taiwan among 754 students in four universities. Jones (2006) also reported similar result when he found a significant effect between transformational leadership and safety performance in natural gas projects in the State of Qatar. Broadbent (2004) conducted a study to maximize safety performance via leadership behavior, and found a positive relationship between transformational leadership and safety performance.

Abdul Wahab, Shah and Idrus, (2012) conducted a study to examine role of transformational leader to safety performance in Malaysian automotive industry. Transformational leadership was measured using items from the "Multifactor Leadership Questionnaire" (Bass, 1995). Self-administered questionnaire surveys were used to collect data from of 696 production employees from Malaysia's automotive manufacturing and assembly plants. The study found that transformational leader had a significant positive effect on safety performance. A similar result was also obtained by Nai-wen and Peng (2012) in a study that examined the relationship between transformational leadership, safety attitude and safety performance in coal mine. The data collected from 6 coal mine enterprises in Jilin, Liaoning, Beijing and Inner Mongolia. The study found that transformational leadership had a significant positive effect on employees' safety performance.

In their study, Clarke and Ward (2006) revealed that transformational leadership style had a significant positive relationship with safety participation in a manufacturing organization in the UK. Related to this study was the research by Kelloway *et al.* (2006) on the divergent effects of transformational and passive leadership on employee safety. The researchers found a relationship between safety-specific transformational leadership and safety-related outcomes, including perceived safety climate, safety events, and safety consciousness. Similarly, Conchie and Donald (2009) conducted a dyads study on safety-specific leadership and safety citizenship behavior among 139 subordinate and supervisor from the UK construction industry. The results of the study showed that a positive relationship between transformational leadership and safety citizenship behavior, among the sample studied.

Machin (2005) analyzed the leadership styles, safety outcomes, and health status of coach drivers from three companies in Australia. Only 49 out of the 300 questionnaires distributed to coach drivers were returned, representing a response rate of only 16.33%. Machin found that transformational leadership is a predictor of organizational safety climate, confirming that organizational safety climate is the mediator of the link between leadership style and outcome measures. In a similar study, Lee (2012) conducted a study to examine the relationship between transformational leadership and workplace safety performance among home health aides. The sample comprised 1,828 National home health aides. This study used a multivariate regression analysis between transformational leadership styles and workplace safety performance. The researcher found that transformational leadership had a significant effect on reducing injury and increasing career satisfaction.

Kelloway, Barling, and Helleur (2000) empirically demonstrated that transformational leaders are able to communicate high safety standards and encourage workers to achieve safety-oriented targets. In addition, a positive relationship was found between transformational leadership and safety performance in that transformational leadership exerted a similar influence on safety performance. Similarly, a study conducted by Burke *et al.* (2006) showed that transformational leadership had a positive influence on safety performance. In the context of healthcare, similar result was shown by Yang *et al.* (2010), who conducted a study on the healthcare industry in Taiwan to examine the relationship among safety culture, leadership styles, and safety performance. The findings of the study demonstrated that leadership behavior affected safety culture and safety performance. The researchers concluded that safety performance can be improved with contingency leadership and a positive culture for patient safety. Transformational leadership was also found to improve safety performance through the mitigation of human errors to decrease occupational accidents.

Koster, Davelaar and Martens (2010) conducted a study to examine the relationship between transformational leadership, safety consciousness and safety performance. The data were collected from an email survey of 79 employees from 55 companies in Netherlands. The results of the study revealed that there was a significant positive relationship between transformational leadership and safety performance.

The above studies were conducted to examine the role of transformational leadership on safety performance in organizations. In comparison, studies that considered both transformational and transactional leadership styles in a single study are limited, indicating that more studies need to be done. Sønderstrup–Andersen *et al.* (2011) explored the relationship between leadership style and safety climate. This study aimed to scrutinize the association between transactional and transformational leadership and safety climate in different industries and with different company sizes in Denmark. Data were collected from 3,681 employees from a wide range of industries by administering the questionnaires online. Sonderstrup–Andersen *et al.* found that the leadership style measured by items related to transactional and transformational leadership had a significant positive association with management safety. A significant correlation was also observed between leadership style (transactional and transformational) and safety climate.

Zohar (2002) conducted a study to investigate the influence of leadership styles, safety climate, and assigned priorities on safety behavior among 42 work groups in Israel. The findings of the study revealed that dimensions of leadership (i.e. transformational leadership and transactional leadership) had significant influence on safety behavior of group members. The author further suggested that transactional leadership style is far more effective than transformational leadership style due to the sound monitoring and rewarding of safety practices that are needed to enhance employee's performance. The author further suggested that transformational leadership is also effective in reducing minor injuries because it influences employees' safety behavior than others.

McFadden, Henagan, and Gowen (2009) examined the effects of transformational leadership on patient safety culture in 200 hospitals in USA. The findings of the study revealed a significant relationship between transformational leadership style and improved patient safety. Additionally, the study found that transformational leadership style had a significant positive effect on patient safety culture.

Still in connection with leadership styles, Fox (2009) conducted a study to examine the relationship between leadership styles (transformational and transactional) and occupational safety in USA. Transformational and transactional leaderships were measured using items from the Multifactor Leadership Questionnaire (Avolio &Bass, 2004). Postal questionnaire surveys were used to collect data from 60 incident commanders included (13 fire/ EMS commanders, 41 police commanders and 6 transportation commanders). The study found that leadership styles had a significant positive effect on occupational safety. In the same vein, Mullen and Kelloway (2009) conducted a study on transformational leadership and safety outcomes among 54 leaders from 21 groups in healthcare firms, Researchers found a significant positive relationship between transformational leadership and occupational safety among the sample studied. Similar studies that affirmed the relationship between transformational leadership and occupational safety were performed by Barling *et al.* (2002), O'Dea and Flin (2001), and McLeod (2008). These studies underscored the idea that transformational leadership plays a significant role in occupational safety.

Another study conducted by Krouse (2009) to examine the relationship between transformational leadership and safety outcomes. This study employed both qualitative and quantitative approaches had a sample size of 37 at 28 facilities within a concrete association located within the Midwest. The study found that no significant between transformational leadership and safety outcomes. In the same vein, Michael, Guo, Wiedenbeck and Ray (2006) conducted a study to examine the relationship between leadership and safety outcomes in USA. The data were collected from a survey of 598 employees from five Pennsylvania wood manufacturers. The researchers found that demographic variables (age and gender) and employee job satisfaction have safety implications. The study found also that leadership had a significant relationship on safety outcome.

Detert and Burris (2007) conducted a study to examine the relationship between transformational leadership and psychological safety in New York. The data were collected from of 3,149 employees and 223 managers in a restaurant chain (response rate of 64%). The study found that transformational leadership has the strongest impact on psychological safety.

In conclusion, the above literatures have shown that a significant link exists between leadership style (transformational and transactional) and safety performance as well as safety issues.

2.6 POSSIBLE MODERATOR

The underlying concept of a moderator variable lies in its influence on the relationship between an independent or predicting variable and a dependent or criterion variable (Baron & Kenny, 1986). Understanding the moderating effects on the relationship among management practices, leadership styles, and safety performance is important. In safety performance-related studies, several moderating variables have been examined, such as safety culture, safety behavior, safety knowledge, safety motivation, and safety claim (Arezes & Miguel, 2003; Chang &Yeh, 2005; Clissold, 2004; Hofmann & Morgeson, 2003; Neal & Griffin, 2002; Siu *et al.*, 2004; Schutte, 2010). But this study considered personality traits as a potential moderator in the relationship among management practice, leadership style, and safety performance.

Numerous reasons exist for selecting personality traits as a moderating variable in the present study. First, the personality of employees that can be characterized as responsible, dependable, suitable for management practices, and compliant with the directives of the leader can improve safety performance. Second, employees with strong personality traits are more likely to seek out information covertly to ensure high performance. Such employees view information gathering as part of the process to succeed in the prevention of accidents and injuries at the workplace. Finally, the role of personality in occupational safety is to increase awareness and understanding of the diversity of individual differences related to accident and injury prevention and to help management upgrade information in developing or improving safety-oriented behavior and attitudes.

Pervin, Cervone, and John (2005) define personality as “a set of relatively enduring behavioral responses and internal predispositions that characterize how a person reacts to the environment” (p.6). It is also regarded as a “unique composite of inborn and acquired mental abilities, temperaments attitudes, and other individual differences in thoughts, feelings, and actions” (Funder, 2004, p. 5). It is also defined “as the sum total of ways in which an individual reacts and interacts with others” (Robbins, 2005, P. 76). The present study defines personality traits as a spectrum of qualities, characteristics, and behavior that make an individual unique.

In the present study, personality traits are considered to comprise five dimensions, often termed the "Big Five," namely, extraversion, conscientiousness, intellect, agreeableness, and emotional stability. Robbins (2005) states that numerous researchers supported the Big-Five model as the five basic dimensions that encompass human personality. McCrae and John (1992) agree that the five-factor model is the best dimension to describe personality. A study by John and Srivastava (1999) supported the reliability of the Big Five in measuring an individual's personality, and were found to broadly capture all elements of personality. In a nut shell, each dimension was found to be distinct and more specific from other dimensions of personality

Previous empirical examinations have considered the Big Five as a moderator between independent and dependent variables. For instance, Chou (2009) conducted a study to investigate if Big Five personality traits had a moderating effect on the relationship between people management and organizational citizenship behavior. He showed that personality traits, such as extraversion, conscientiousness, intellect, agreeableness, and emotional stability, had a significant positive relationship as a moderator between people management and organizational citizenship behavior. In another study, Colquitt, Scott, Judge and Shaw (2006) observed the "Big Five" personality traits as a moderator of the relationship between interpersonal justice and task performance. Two hundred and thirty eight undergraduates from southeastern university in the US participated in the study. The study revealed that personality traits, such as extraversion, conscientiousness, intellect, agreeableness, and emotional stability, moderated the relationship between interpersonal justice and task performance.

Elovainio *et al.* (2003) probed how personality can be a moderator in the relationship between perceptions of organizational justice and health-related behavior. Four thousand and seventy six employees from 7 in 23 healthcare districts in Finland participated in the study. As predicted, the study found personality traits moderated the relationship between perceived organizational justice and safety behavior. Similarly, Kochanska, Aksan, Penney, and Boldt (2007) examined the moderating effects of personality traits on the relationship between demographic risk and parenting in a longitudinal study among 102 preschoolers in USA. The researchers found that personality traits, such as extraversion, conscientiousness, intellect, agreeableness, and emotional stability, had a positive impact as a moderator of relationships between demographic risk and parenting.

Benoliel and Somech (2009) conducted a study to explore the moderating role of personality traits from the Big Five typology on the relationship between participative management and teacher performance. Data were collected from a survey of 153 elementary school teachers and their principals in Northern and Central Israel. Hierarchical regression analyses showed that the personality dimensions of extroversion, agreeableness, conscientiousness, and emotional stability served as moderators of the relationship between participative management and teacher performance. However, openness to experience was found to have no moderating impact on such relationships.

Myers, Sen, and Alexandrov (2010) conducted a study to investigate the personality traits that moderated the relationship between type of advertisement exposure and attitude toward the advertisements in the US. They found that personality traits, namely, extraversion, conscientiousness, intellect, agreeableness, and emotional stability, moderated the relationship between type of advertisement exposure and attitude toward the advertisements. Likewise, Markey and Markey (2010) observed that personality traits had a negative moderating effect on the relationship between video games and violence.

Lazaridès, Bélanger, and Sabourin (2010) examined the moderating role of personality in the relationship between communication behavior and couple stability. They found that among the Big Five, only extraversion, agreeableness, and emotional stability had a moderating effect between communication behavior and couple stability. On a similar note, Biesanz and West (2000) found that personality traits had a positive moderating effect on self-other profile and profile consensus. Zweig and Webster (2003) also conducted a study to examine the moderating role of personality traits on the relationship between perceived workplace monitoring system, fairness, privacy, characteristics, and acceptance. Results indicated that emotional stability and extraversion had a positive moderating effect on workplace monitoring system characteristics, fairness, privacy, and acceptance. Likewise, Ziegler, Knogler and Bühner (2009) conducted a study to examine the moderating role of personality in the relationship between intelligence and Grade Point Average (GPA) from a sample of German psychology students. They found personality to have a positive relationship as a moderator between intelligence and GPA.

In a different study, Oishi and Schimmack (2010) revealed that personality traits moderated the relationship between residential mobility and well-being. On a similar note, Samad (2007) conducted a study to investigate the moderating effect of personality on the relationship between social structural characteristics and employee empowerment in Malaysia among 584 managerial employees of the leading telecommunication company in Malaysia. He found that personality had a moderating effect between social structural characteristics and employee empowerment.

Metsäpelto and Pulkkinen (2005) examined personality as a moderator in the relationship between self-reported and observed parenting in Finland. They found that extraversion had a moderating effect between self-reported and observed parenting. Similarly, Matz, Hofstedt, and Wood (2008) found that a personality trait (extraversion) was a positive moderator in the relationship between cognitive dissonance and disagreement in the US among 205 undergraduate students from introductory psychology courses at Texas A&M University.

Lin and Ong (2010) examined personality as a moderator between information system use and intention to use information system among 65 students of a public university in Taiwan. They found conscientiousness to be a moderator of the relationship between information system use and intention to use information systems. Likewise, Krishnan and Lim (2010) conducted a study to examine personality traits as moderators between sleep deprivation and time spent on cyberloafing in Singapore. The sample comprised 99 students from Singapore University. The study found that personality traits (extraversion and emotional stability) moderated the relationship. Similarly, Jung, Lee, and Karsten (2012) found that extraversion had a positive moderating effect on the relationship between the level of cognitive stimulation and idea generation.

Alexander (2009) conducted a study to examine personality traits as moderator of the relationship between proactive behaviors and supervisor performance evaluations. The samples of the study included 282 employees and 149 supervisors from 21 U.S. non-profit organizations. Alexander discovered that personality traits such as intellect, agreeableness, and emotional stability moderate the relationships between proactive behaviors and supervisor performance evaluations. On a similar note, Baker and McNulty (2011) examined personality traits as a moderator of the relationship between self-compassion and motivation to correct interpersonal mistakes in the US. A total of 243 undergraduate students, 143 women and 100 men, from the University of Tennessee participated in the study. Baker and McNulty found that a personality trait moderates the relationship between self-compassion and motivation to correct interpersonal mistakes.

Jensen–Campbell and Graziano (2001) showed personality traits as a moderator of the relationship between interpersonal conflict and conflict strategies. One hundred and sixty seven secondary students, from the Brazos Valley in central Texas were included in the study. The study found only agreeableness as the personality trait that moderates the relationship between interpersonal conflict and conflict strategies.

In 2010, Sanza researched on the moderating role of personality traits from the Big Five typology on the relationship between work organization and psychological distress. The data were collected from a survey of 395 workers from a municipal police service in Canada. Hierarchical regression analyses showed that the personality dimensions of agreeableness, emotional stability, conscientiousness, extroversion and openness to experience served as moderators of the relationship between work organization and psychological distress. Haron, Iskandar and Salleh (2011) conducted a study to investigate the moderating role of personality traits on the relationship between perceived external auditors' ability to detect fraud risk and likelihood of fraud. The findings of the study revealed that personality traits were not moderators on perceived external auditors' ability to detect fraud risk - likelihood of fraud relationship.

Klehe and Anderson (2007) conducted a study to examine personality traits as a moderator of the relationship between the extents to which situational factor leads social loafing among 488 undergraduate who offered psychology on the University of Amsterdam campus. Results showed the positive role of personality traits as a moderator of the relationship between the degree to which the situation invites social loafing and the typical versus maximum performance condition. In a related study, Caligiuri (2000) investigated personality traits as a moderator of the relationship between host national contact and cross-cultural adjustment. He sent questionnaires to 280 American expatriate employees who came from 25 different countries. One hundred and forty three questionnaires completed and returned directly to the researcher by mail, thereby given a response rate of 51%. The study found a personality trait (intellect), what is known openness to experience, as a moderator of the relationship between host national contact and cross-cultural adjustment.

Ronn (2010) studied personality traits as a moderator of the relationship between career management and affective organizational commitment. The data were collected from a questionnaire administered to 311 employees in a South African public sector organization. The study found only openness to experience as a moderator of the relationship between career management and affective organizational commitment., In their own study, Hofmann, Gschwendner and Schmitt (2005) found a personality trait (conscientiousness) as a moderator of the relationship between attitudinal self-knowledge and attitude importance. A total of 93 psychology students (66 female and 27 male) from the University of Trier in West Germany participated.

Jacobs, Szer and Roodenburg (2012) included an examination of personality traits as a moderator of the relationship between test-based and self-estimated in Australia. The participants of the study were 189 persons who completed the psychological personality tests. The researchers found that personality traits (intellect, agreeableness and emotional stability) moderate relationships between test-based and self-estimated. Similarly, Halbinger (2012) examined personality traits as a moderator between motivation and entrepreneurship among 17 visitors of a physical IT hacker space in the South of Germany. The study found that personality traits (intellect) moderated the relationship.

Baer and Oldham (2006) studied personality traits as a moderator of the relationship between creative time pressure and creativity among 170 employees and 10 supervisors of a manufacturing organization in USA. The study found only openness to experience as a moderator of the relationship between creative time pressure and creativity. On a similar note Bennett *et al.* (2001) found conscientiousness as a moderator of the relationship between abusive supervision and subordinates' resistance.

Wu, Chen and Lu (2011) conducted a study on motivation, opportunity, and ability on share knowledge, destination image and behavioral intention. The moderating role personality traits of is also examined. Data were collected from a survey of 262 virtual travel community members who are at least 18 years of age or older and have travel experiences. Hierarchical regression analyses showed that the personality dimension of openness to experience as moderators of the relationship between motivation, opportunity, and ability on share knowledge. On a similar note, Clarke, (2004) conducted a study to examine personality traits as a moderator of the relationship between the locus of control and depression among 165 students of psychology from Albany campus of Massey University. The study found emotional stability as a moderator of the relationship between the locus of control and depression.

Kammeyer-Mueller, Judge& Scott, (2009) examined personality traits as a moderator of the relationship between stressors and strain in USA. The data were collected from a survey of 395 workers from university of Florida. The study found emotional stability as a moderator of the relationship between stressors and strain. Likewise, Mikolajczak, Roy, Verstrynge and Luminet, (2009) conducted a study to investigate the moderating role of personality traits the relationship between stressful conditions, memory and attention among 67 undergraduate students from University´ Catholique de Louvain in Belgian. The findings of the study revealed that emotional stability as one of the dimensions of personality traits moderated the relationship between memory and attention.

Other studies also managed to show the significant moderating influence of personality traits (e.g. Afsar, Shahjehan & Rehman, 2011; Barrantes-Vidal, Ros-Morente & Kwapil, 2009; Horner, 1996 ; Judge & Larsen, 2001; Meier *et al.*, 2006; Simon, Judge & Halvorsen-Ganepola, 2010; Wang, Chen & Tsai, 2010), suggesting that individual characteristics could help explain the differences in the social phenomenon under study. On this score that the present study argues that personality traits to have a theoretical moderating influence on enhancing safety performance when management practices and leadership styles are taken into account,

2.7 UNDERPINNING THEORY

This study investigates the influence of management practice and leadership styles on safety performance. In addition, the study also incorporates the moderating effect of personality traits on this relationship. This relationship is best explained using social exchange theory. The following section will discuss this theory and its application to this present study.

2.7.1 Social Exchange Theory

Social exchange theory is based on the psychological and sociological points of view. This theory postulates that any form of human interaction is based on the exchange of social and material resources (Feldman, 2003; Michener, 2004). The idea behind this theory is reinforcement of compensation between one party (i.e employer) another party (i.e employee) (Skarlicki & Folger, 1997). Masterson, Lewis, Goldman, and Taylor (2000) state that "social exchange relationships are different from those based on purely economic exchange in that the obligations of the parties in a social exchange to one another are often unspecified and the standards for measuring contributions are often unclear" (Masterson *et al.*, 2000, p. 739). Additionally, Blau (1964) defines social exchange theory by describing how individuals enter into relationships that are not only economic, but also diffuse relevant social obligations. The social exchange perspective can be used to provide a better explanation on employment relationship (Cropanzano & Mitchell, 2005). In particular, social exchange theory can be used to better explain the relationships between human resource practices and employee's attitude, including organizational commitment and job satisfaction (Eisenberg, Fasolo, & Davis–LaMastro, 1990; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Spector, 1997).

Social exchange theory was developed by Gouldner (1960), who explained that individuals should return the benefits given to them in a specific relationship. In other words, when one employee acts in a particular manner that benefits other members of the organization, an implicit obligation for future reciprocity is said to have been made. This reciprocity results in a positive change in behavior, which is integrated to benefit the initiating employee (Bierhoff, 2009; Settoon, Bennett, & Liden, 1996). In addition, social exchange theory explains employees' struggle to maintain equitable exchanges of resources in social and economic aspects within their organization. Therefore, obligated employees are expected to return to their organization when they secured some valuable resources from their organization, including compensation package and recognition. Similarly, when they could not obtain such valuable resources the reverse is the case (Zafirovski, 2005).

The term reciprocal exchange refers to the expectation that when employees receive rewards, they respond accordingly by doing good things for others (Homans, 1974). Tsui, Pearce, Porter, and Tripoli (1997) confirmed that employees who are highly committed are likely to performance better than those who are less committed. In other words, when an individual is highly committed to organization, he is likely to be more productive than those who are not (Cho & Johanson, 2008).

Previous studies have social exchange perspective to investigate employee attitudes and behaviors. For example, Eisenberger, Huntington, Hutchison, and Sowa (1986) suggested that perceived organizational support trigger trust in turn make employee to perform better and vice versa (Eisenberg *et al.*, 1990).

Previous studies on safety have utilized social exchange theory in explaining the social phenomenon under study (e.g. Cooper & Phillip, 2004; Hofmann & Morgeson, 1999; Hofmann *et al*., 2003; Hofmann & Stetzer, 1996; Michael, Guo, Wiedenbec, & Ray, 2006; Neal & Griffin, 2006; Wayne *et al.*, 2002). In the present study, management practice and leadership styles are resources given to employees by the organization. Therefore, a reciprocal exchange is postulated to occur between the employee and the organization. In other words, employees are expected to give back to their organization with high safety performance, which implies that they are expected to comply with safety behavior and participate in safety activities. When management provides sufficient training to employees or good rewards, the employees would consequently perform their duties efficiently and safely, which then results in improved safety performance.

Therefore, the use of the social exchange theory is justified and sets the direction of the present study.

In summary, social exchange theory postulates that individuals try to strike equitable exchanges of resources, including economic and social resources with their organizations. Hence, employees tend to reciprocate to their organizations when they obtained some valuable things from their organization. Conversely, when they could not obtained something of value from their organization, they may retaliate with negative behavior or attitudes. In this study, social exchange theory will be empirically tested and will constitute the foundation for examining how management practices and leadership styles help promote positive employee attitudes, such as prevention of accidents and occupational injuries or the improvement of safety performance in the workplace.

2.8 SUMMARY

Recent reviews on safety performance found that safety performance refers to the probability that workplace accidents would cause fatal injury or property damage (Chang & Yeh, 2004; Huang *et al.*, 2006; Moses & Savage, 1992; Moses, 1994; Mejza, 1998). Safety performance refers to the level of safety that controls the number of accidents and injuries at the workplace (Siu *et al.*, 2004). In short, safety performance could be expected to play a large role in the prevention of accidents and injuries, as well as in measuring workplace safety.

Previous studies on management practices, leadership styles, and safety performance have indicated that if all these variables are used as a set, they can help improve safety performance. Moreover, management practices can support the behavioral aspects of employees to encourage them to behave and act safely. In addition, previous studies on management practices have indicated the role of safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation in improving safety performance. Several researchers have examined the effect of leadership styles on safety performance. Leadership was found to be related to safety issues and safety performance via monitoring whether the employees remain in line with safety obligations in the organization.

However, researchers to date have not addressed the moderating effect of personality traits on safety performance. Because individuals differ in their personality characteristics, we believe that these differences could play a role in explaining their safe behavior at work. Thus, in the present study, personality traits are examined as a moderator of the relationship among management practices, leadership styles, and safety performance in the Iraqi oil and gas industry, to fill the existing gaps in the current knowledge of safety.

In the next chapter, a detailed explanation is offered on how the research project was practically carried out in the attempt to meet the research objectives set earlier.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter has discussed the related literatures on management practice, leadership style, personality traits, and safety performance. To recap, the present study intends to investigate the relationship among management practices, leadership styles, personality traits, and safety performance in the Iraqi O&G industry. Specifically, this study examines the moderating effects of personality traits on the relationship among management practices, leadership styles, and safety performance. This chapter presents an overview of the methodology used to arrive at the logical sequence of the research process, which includes the theoretical framework, statement of hypotheses, research design, identification of population, sample size and sampling technique, data collection, measurement of variables and instrumentation, and data analysis procedures. This chapter ends with a summary.

3.2 THEORETICAL FRAMEWORK

Safety performance is generally measured by compliance with safety behavior and safety participation (e.g. Jiang *et al.*, 2010; Kim & Park 2001; Lu & Yang, 2010; Neal, Griffin,& Hart, 2000; Schutte, 2010). Various scholars (e.g. Broadbent, 2004; Chang &Yeh, 2005; Enshassi *et al.*, 2008; Griffin & Neal, 2000; Hsu *et al.*, 2008; Hayes *et al.*, 1998; Mearns& Yule, 2009; Rakel *et al.*, 1998; Siu, et al, 2004; Wu *et al.*, 2010; Zohar,

2000) have emphasized the importance of improving safety performance to reduce occupational accidents.

Previous studies have indicated that safety performance is influenced by management practices (e.g. Ali *et al.*, 2009; Arboleda *et al.*, 2003; Dorji & Hadikusumo, 2006; Geldart *et al.*, 2010; Mearns *et al.*, 2003; Razuri *et al.*, 2007; Skjerve, 2008; Tavares, 2009; Vredenburgh, 2002; Vinodkumar & Bhasi, 2010; Westmorland *et al.*, 2005). Management practices are practices aimed by the management to achieve occupational safety and to improve the capacity of workers to prevent accidents and injuries (Dorji & Hadikusumo, 2006; Geldart *et al.*, 2010; Gordon, Flin, & Mearns, 2005; Skjerve, 2008). Management practices are also proactive policies and measures for the prevention of occupational accidents (Gershon *et al.*, 2000), such as by having safety procedures, monitoring, and auditing in place (European Process Safety Center, 1994). Thus, this study adopts management practices as the independent variable.

Aside from management practices, leadership styles are another independent variable examined in this study, as they have been shown to have a link with safety performance (Barling *et al.*, 2002; Broadbent, 2004; Griffin, 2007; Idrus *et al.*, 2009; Künzle *et al.*, 2010; Lu & Yang, 2010; Reid *et al.*, 2008; Schimpff, 2007; Wu *et al.*, 2008; Yang *et al.*, 2010). Leaders can affect safety performance by encouraging workers to be safety-conscious (Lu & Yang, 2010; O'Dea & Flin, 2001; Zhou, Fang & Wang, 2008) and by providing the necessary environment for workers to participate in safety-oriented programs and activities (Carrol & Hatakenaka, 2001; Cooper & Philips, 2004; Hopkin, 1999; Lu & Shang, 2005; Lu & Yang, 2010; O'Dea & Flin, 2003; Smallman & John, 2001). In other words, a leader can reportedly control the rate of human errors in the course of the prevention of occupational accidents.

This study contributes to the body of knowledge by investigating the moderating effect of personality traits on the relationship between management practices and leadership styles in terms of safety performance. As previously mentioned, the effects of management practices and leadership styles on safety performance can be enhanced when employees have a specific type of personality trait because previous literature indicates that various employees behave differently as regards to safety (Geller, 2004; Geller & Wiegand, 2005; Williams & Geller, 2000; Zhou *et al.*, 2008). Some employees seriously consider precautionary measures, while others have a negative lackadaisical attitude toward the improvement of safety performance (Lu & Yang, 2010).

In this study, personality traits are considered to be capable of influencing safety performance at the workplace. Previous studies have found that personality traits moderate the relationship between attitude toward advertisements and purchase intentions (Myers *et al.*, 2010), as well as that between people management and organizational citizenship behavior (Chou, 2009). In addition, personality traits were also found to moderate the relationship between conflict and informant consensus (Biesanz & West, 2000). Similarly, Kochanska *et al.* (2007) observed that personality traits could moderate the relationship between demographic risk and parenting. In the present study, personality traits are examined as a moderator of the relationship among management practices, leadership styles, and safety performance. Empirical evidence gathered from this study can serve as a foundation for the research framework.

A schematic model that demonstrates the relationship among management practices, leadership styles, personality traits, and safety performance is presented in Figure 3.1. The figure presents an overview of the variables to be tested in this study. The first independent variable is management practices, which purportedly has six dimensions, namely, safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation. The second independent variable is leadership styles, theoretically proposed to have two dimensions, namely, transformational and transactional leadership. The dependent variable of this study is safety performance, which is measured using two dimensions, namely, compliance with safety behavior, and safety participation. Meanwhile, the moderating variable of this study is personality traits, which comprise theoretically five dimensions, namely, extraversion, conscientiousness, intellect, agreeableness, and emotional stability.

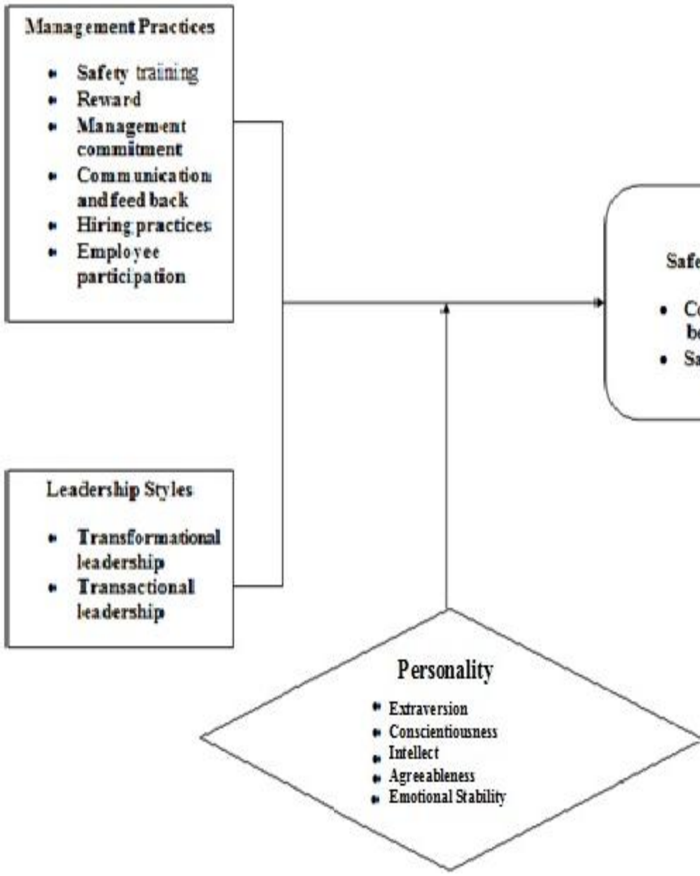

Figure 3. 1
Theoretical Framework of the Present Study

3.3 HYPOTHESES OF THE STUDY

A hypothesis is a formal proposition of the assumed logical relationship between two or more variables, which is based on an empirically testable theoretical framework to find the expected solution to the problem statement (Sekaran & Bougie, 2010; Zikmund, Babin, Carr & Griffin, 2010). In this section, the literature that supports these relationships and the hypotheses that define them are presented.

3.3.1 Main Effect of Management Practices and Safety Performance

Numerous studies have demonstrated the significant relationship between management practices and safety performance (e.g. Huang *et al.*, 2006; Razuri *et al.*, 2007; Skjerve, 2008; Sgourou *et al.*, 2010; Varonen & Mattila, 2000). Management practices have been found to be a significant and positive predictor of safety performance in the hospital setting (e.g. Vredenburgh, 2002). Similarly, Ali *et al.* (2009) found a significant linear relationship between management practices and injury rates in the manufacturing industry. The same linear relationship was observed by Mearns *et al.* (2003), who conducted a study on the O&G industry, and by Dorj and Hadikusumo (2006), who conducted a study on the construction industry. Generally, the results appeared to indicate that better management practices within an organization result in the achievement of better safety performance. Vinodkumar and Bhasi (2010) investigated the effect of management practices on safety performance in Kerala, India. They found a significant and positive relationship between management practices and safety performance. In a similar study, Geldart *et al.* (2010) conducted a study to investigate management practices and workplace health and safety for manufacturing companies in Canada. The study found a significant and positive relationship between management practices and lower injury rates.

The link between management practices and safety performance can be understood from the social exchange perspective, which argues that reciprocity governs a social relationship where a good gesture by one party is returned with the same gesture by another party. In the context of an employment relationship, when the management provides sufficient training to employees or offers rewards, employees tend to perform their duties efficiently and safely. Employees thus become cautious and engage in safety practices to avoid injuries and accidents at the workplace. Such behavior is manifested through compliance to safety policies and participation in safety intervention programs. Implementing safety practices is expected as a gesture by members of the organization in exchange for the favorable contributions of the management. Hence, the following hypotheses are developed:

H1: Management practices are positively related to safety performance.

H1a: Safety training is positively related to compliance with safety behavior.

H1b: Reward is positively related to compliance with safety behavior.

H1c: Management commitment is positively related to compliance with safety behavior.

H1d: Communication and feedback is positively related to compliance with safety behavior.

H1e: Hiring practices is positively related to compliance with safety behavior.

H1f: Employee participation is positively related to compliance with safety behavior.

H1g: Safety training is positively related to safety participation.

H1h: Reward is positively related to safety participation.

H1i: Management commitment is positively related to safety participation.

H1j: Communication and feedback is positively related to safety participation.

H1k: Hiring practices is positively related to safety participation.

H1l: Employee participation is positively related to safety participation.

3.3.2 Main Effect of Leadership Style and Safety Performance

In this study, two types of leadership styles are examined, namely, the transformational and transactional leadership styles. As regards to transformational leadership, a number of previous studies have found its positive effect on safety performance (e.g. Barling *et al.*, 2002; Inness *et al.*, 2010; Idrus et al, 2009; Mullen & Kelloway, 2009; Yang *et al.*, 2010; Zohar, 2002). A transformational leader can positively influence employee safety performance because his leadership style can develop and motivate people to commit themselves to more challenging goals. In addition, transformational leadership is made powerful by open communication. Open communication is beneficial in non-routine problems, which can lead to accidents and injury at the workplace (Zimolong & Elke, 2006). Research by Zohar (2002) revealed that transformational leadership was the best predictor of injury reduction.

On transactional leadership, a limited number of studies indicated its significant relationship with safety performance. Yule *et al.* (2007) found an element of transactional leadership style (i.e. contingent reward) that was significantly related to safety performance (i.e. lower accident rates). Clarke and Ward (2006) concluded that the transactional leadership style influenced safety performance because of effective monitoring and rewarding practices, which are necessary to maintain reliable performance during routinely job operations. Wu *et al.* (2008) indicated that when transactional leaders became involved in safety initiatives and ensured compliance with regulatory requirements by providing resources for a comprehensive safety program, they enhanced the safety performance of employees. Similar to management practices, the influence of leadership style on safety performance can be understood from the social exchange perspective, which explains a fundamental form of interaction based on the exchange of benefits between leaders and employees in an organization. Good social exchanges between leaders and employees foster the achievement of good safety performance through safety compliance and participation (Ahmadi, Forouzandeh, & Kahreh, 2010; Yukl, 2002). When a leader guides employees on safety measures or listens to the demands of employees with respect to safety issues, employees feel obliged to reciprocate by showing good safety behavior and hence perform safely at work. Hence the following hypotheses are offered:

H2: Leadership styles are positively related to safety performance.

H2a: Transformational leadership is positively related to compliance with safety behavior.

H2b: Transactional leadership is positively related to compliance with safety behavior.

H2c: Transformational leadership is positively related to safety participation.

H2d: Transactional leadership is positively related to safety participation.

3.3.3 Interaction Effect of Personality

This study investigates the moderating effect of personality traits on the relationship among management practices, leadership styles, and safety performance. Given that the moderating effect of personality traits in this context has not been previously examined, non-directional hypotheses are introduced. A non-directional hypothesis is developed when a relationship or differences have never been explored. Thus, the focus is unknown as a result of contradictions among findings on the involved variables in past studies (Sekaran & Bougie, 2010).

Previous literature has stated that safety performance varies from one individual to another, suggesting that personality differences influence the effectiveness of safety measures at work (Geller, 2004; Geller & Wiegand, 2005; Williams, 2003; Zhou *et al.*, 2008). In this study, employees with positive personality traits are expected to be more compliant to safety procedures and more participative in safety programs because of their desire to display their abilities for self-realization and for the achievement of personal goals, and of the objectives of the organization (Cellar *et al.*, 2001; Oltedal & Rundmo, 2006). Varying compliance to safety procedures provides increased awareness and understanding of the diversity of personality traits in relation to injury prevention and justifies the development of interventions to improve safety performance (Lemming, Johnson, & Foster, 2008).

Sansa (2010) studied personality traits as a moderator of the relationship between work organization and psychological distress. Hierarchical regression analyses showed that the personality dimensions of extroversion, agreeableness, conscientiousness, emotional stability, and openness to experience acted as moderators of the relationship between work organization and psychological distress. Similarly, Myers *et al.* (2010) conducted a study to investigate the personality traits that moderated the relationship between type of advertisement exposure and attitude toward the advertisements in the US. They found that personality traits, namely, extraversion, conscientiousness, intellect, agreeableness, and emotional stability moderated the relationship between type of advertisement exposure and attitude toward the advertisements. On the same note, Chou (2009) conducted a study to investigate if Big Five personality traits had a moderating effect on the relationship between people management and organizational citizenship behavior. He showed that personality traits, such as extraversion, conscientiousness, intellect, agreeableness, and emotional stability, had a significant positive relationship as a moderator between people management and organizational citizenship behavior.

Personality traits consist of a variety of individual characteristics that can impact on an individual's awareness of personal injury and his /her participation in an injury-prevention program (Foster & Chen, 2007; Geller, 2004). Thus, when management provides the necessary support in terms of reward, commitment, and training, and when the leader provides favorable leadership, employees who have good personality traits become more obliged to reciprocate by engaging in better safety behavior. Hence, the following hypotheses are offered:

H3: Personality moderates the relationship between management practices and safety performance.

H3a: Extraversion moderates the relationship between safety training and compliance with safety behavior.

H3b: Extraversion moderates the relationship between reward and compliance with safety behavior.

H3c: Extraversion moderates the relationship between management commitment and compliance with safety behavior.

H3d: Extraversion moderates the relationship between communication and feedback and compliance with safety behavior.

H3e: Extraversion moderates the relationship between hiring practices and compliance with safety behavior.

H3f: Extraversion moderates the relationship between employee participation and compliance with safety behavior.

H3g: Extraversion moderates the relationship between safety training and safety participation

H3h: Extraversion moderates the relationship between reward and safety participation.

H3i: Extraversion moderates the relationship between management commitment and safety participation.

H3j: Extraversion moderates the relationship between communication and feedback and safety participation.

H3k: Extraversion moderates the relationship between hiring practices and safety participation.

H3l: Extraversion moderates the relationship between employee participation and safety participation

H3m: Conscientiousness moderates the relationship between safety training and compliance with safety behavior.

H3n: Conscientiousness moderates the relationship between reward and compliance with safety behavior.

H3o: Conscientiousness moderates the relationship between management commitment and compliance with safety behavior.

H3p: Conscientiousness moderates the relationship between communication and feedback and compliance with safety behavior.

H3q: Conscientiousness moderates the relationship between hiring practices and compliance with safety behavior.

H3r: Conscientiousness moderates the relationship between employee participation and compliance with safety behavior.

H3s: Conscientiousness moderates the relationship between safety training and safety participation.

H3t: Conscientiousness moderates the relationship between reward and safety participation.

H3u: Conscientiousness moderates the relationship between management commitment and safety participation.

H3v: Conscientiousness moderates the relationship between communication and feedback and safety participation.

H3w: Conscientiousness moderates the relationship between hiring practices and safety participation.

H3x: Conscientiousness moderates the relationship between employee participation and safety participation.

H3y: Intellect moderates the relationship between safety training and compliance with safety behavior.

H3z: Intellect moderates the relationship between reward and compliance with safety behavior.

H3aa: Intellect moderates the relationship between management commitment and compliance with safety behavior.

H3ab: Intellect moderates the relationship between communication and feedback and compliance with safety behavior.

H3ac: Intellect moderates the relationship between hiring practices and compliance with safety behavior.

H3ad: Intellect moderates the relationship between employee participation and compliance with safety behavior.

H3ae: Intellect moderates the relationship between safety training and safety participation.

H3af: Intellect moderates the relationship between reward and safety participation.

H3ag: Intellect moderates the relationship between management commitment and safety participation.

H3ah: Intellect moderates the relationship between communication and feedback and safety participation.

H3ai: Intellect moderates the relationship between hiring practices and safety participation.

H3aj: Intellect moderates the relationship between employee participation and safety participation.

H3ak: Agreeableness moderates the relationship between safety training and compliance with safety behavior.

H3al: Agreeableness moderates the relationship between reward and compliance with safety behavior.

H3am: Agreeableness moderates the relationship between management commitment and compliance with safety behavior.

H3an: Agreeableness moderates the relationship between communication and feedback and compliance with safety behavior.

H3ap: Agreeableness moderates the relationship between hiring practices and compliance with safety behavior.

H3aq: Agreeableness moderates the relationship between employee participation and compliance with safety behavior.

H3ar: Agreeableness moderates the relationship between safety training and safety participation.

H3as: Agreeableness moderates the relationship between reward and safety participation.

H3at: Agreeableness moderates the relationship between management commitment and safety participation.

H3au: Agreeableness moderates the relationship between communication and feedback and safety participation.

H3av: Agreeableness moderates the relationship between hiring practices and safety participation.

H3aw: Agreeableness moderates the relationship between employee participation and safety participation.

H3ax: Emotional stability moderates the relationship between safety training and compliance with safety behavior.

H3az: Emotional stability moderates the relationship between reward and compliance with safety behavior.

H3ba: Emotional stability moderates the relationship between management commitment and compliance with safety behavior.

H3bb: Emotional stability moderates the relationship between communication and feedback and compliance with safety behavior.

H3bc: Emotional stability moderates the relationship between hiring practices and compliance with safety behavior.

H3bd: Emotional stability moderates the relationship between employee participation and compliance with safety behavior.

H3be: Emotional stability moderates the relationship between safety training and safety participation.

H3bf: Emotional stability moderates the relationship between reward and safety participation.

H3bg: Emotional stability moderates the relationship between management commitment and safety participation.

H3bh: Emotional stability moderates the relationship between communication and feedback and safety participation.

H3bi: Emotional stability moderates the relationship between hiring practices and safety participation.

H4: Personality moderates the relationship between leadership styles and safety performance.

H4a: Extraversion moderates the relationship between transformational leadership and compliance with safety behavior.

H4b: Extraversion moderates the relationship between transactional leadership and compliance with safety behavior.

H4c: Extraversion moderates the relationship between transformational leadership and safety participation.

H4d: Extraversion moderates the relationship between transactional leadership and safety participation.

H4e Conscientiousness moderates the relationship between transformational leadership and compliance with safety behavior.

H4f: Conscientiousness moderates the relationship between transactional leadership and compliance with safety behavior.

H4g: Conscientiousness moderates the relationship between transformational leadership and safety participation.

H4h: Conscientiousness moderates the relationship between transactional leadership and safety participation

H4i: Intellect moderates the relationship between transformational leadership and compliance with safety behavior.

H4j: Intellect moderates the relationship between transactional leadership and compliance with safety behavior.

H4k Intellect moderates the relationship between transformational leadership and safety participation.

H4l: Intellect moderates the relationship between transactional leadership and safety participation.

H4m: Agreeableness moderates the relationship between transformational leadership and compliance with safety behavior.

H4n: Agreeableness moderates the relationship between transactional leadership and compliance with safety behavior.

H4o Agreeableness moderates the relationship between transformational leadership and safety participation.

H4p: Agreeableness moderates the relationship between transactional leadership and safety participation.

H4q: Emotional stability moderates the relationship transformational leadership and compliance with safety behavior.

H4r: Emotional stability moderates the relationship transactional leadership and compliance with safety behavior.

H4s: Emotional stability moderates the relationship transformational leadership and safety participation.

H4t: Emotional stability moderates the relationship transactional leadership and safety participation.

3.4 RESEARCH DESIGN

A research design comprises a strategic plan that includes specific methods and procedures for collecting and for analyzing the required data on the study population to obtain the solution to the problem statement (Sekaran & Bougie, 2010; Zikmund *et al.*, 2010). The primary purpose of this study is to explore the relationship among management practices, leadership styles, personality traits, and safety performance to propose a solution to the problems encountered in the Iraqi O&G industry. In this regard, the following sections include the purpose of the research, nature of the study, and unit of analysis.

3.4.1 Purpose of Research

The purpose of a study defines what is to be accomplished through the conduct of the research and how the results will be used (Yin, 2003). Several scholars have identified three primary purposes of research, namely, exploratory, descriptive, and hypotheses testing (Sekaran & Bougie, 2010). Exploratory research is conducted when the problem examined has not been sufficiently and clearly defined. This approach helps describe the situation, seeks new insights, asks key questions, and deals with a set of phenomena from a new perspective. This approach always uses qualitative methods. Meanwhile, descriptive research is conducted to explain phenomena accurately using narrative descriptions, classification, or measured relationships. In other words, descriptive research depicts an accurate profile of events, organizations, or situations (Robson, 2002; Sekaran & Bougie, 2010). Finally, hypothesis testing enables researchers to uncover and to infer causal relationships among variables (Sekaran & Bougie, 2010).

Based on the above explanation, the present research is mainly to test hypotheses developed based on the research questions and objectives set earlier. Specifically, the present study seeks to explain the influence of management practices, leadership styles, and personality traits, on safety performance. To answer the research question on the level of safety performance of the Iraqi O&G industry, a descriptive analysis was carried out.

3.4.2 Nature of the Study

To satisfy the research objectives of this study, the use of a quantitative approach is considered suitable. Quantitative research is a formal, objective, and systematic process that describes and investigates the expected relationship and computes the interaction effects among variables (Burns & Grove, 2005). The quantitative approach to data analysis is valuable for a researcher who aims to derive significant results from the data collected. In addition, the approach provides a summary of the analysis results in statistical values that provide a high degree of confidence (Alexei, 2002; Zikmund *et al.*, 2010). Accordingly, the researcher has sufficient justification for the use a quantitative approach. This study is quantitative in nature, as it attempts to explore the connection among management practices and leadership styles, personality traits, and safety performance. In addition, the data in this study are cross-sectional, as they are collected at only one point in time (Neuman, 1997).

3.4.3 Unit of analysis

According to Sekaran and Bougie (2010) and Zikmund *et al.* (2010), researchers must explain their unit of analysis to find a solution to the problem statement. The unit of analysis refers to the level of aggregation of the data to be collected during the data analysis phase. The unit of analysis is the unit used by a researcher in the measurement of variables (Neuman, 1997; Sekaran, 2003). The unit of analysis may be at the individual, group, business unit, or organizational level. This study, in an effort to understand how safety performance can be improved, investigates the role of management practices and leadership styles as perceived by employees. Thus, the level of analysis is individual-based, which means that the data collected from the employees are aggregated at the individual level.

3.5 POPULATION, SAMPLE, AND SAMPLING TECHNIQUE

Employees that share a common set of characteristics are classified as one population, while elements of a population are called individual members of a population. A subset or a small part of the population is known as a sample (Zikmund *et al.*, 2010).

3.5.1 Population

Population is defined by Cooper and Schindler (2008) as people, events, or records that possess the desired information and that can answer measurement questions. This study, which examines the safety performance of employees in Iraqi O&G companies, operates under the supervision of the Ministry of Oil and Gas. Individuals who are at risk of occupational accidents at the workplace, such as technicians, electricians, mechanics, welders, drillers, engineers, and other similar employees, are considered as members of the study population. As of 15 July 2009, the O&G companies in Iraq numbered 14, and they collectively employ 42,203 employees who fit the definition put forward in this study. This sample represents 53% of the total number of employees in the Iraqi O&G industry. The breakdown of the study population by company and by total number of employees who are at risk of occupational accidents is shown in Table 3.1.

Table 3.1
Total Number of Oil and Gas Companies in Iraq and the Number of Employees (as of July 2009)

No	Company name	No. of employees
1	North of Company	6230
2	South Oil Company	10620
3	South Gas Company	1330
4	Iraqi Tanker (Truck) Company	850
5	Gas Filling Company	2200
6	Iraqi Drilling Company	2480
7	Oil Pipeline Company	1655
8	Oil Products Distribution Company	7251
9	Oil Exploration Company	750
10	North Gas Company	920
11	South Refinery Company	2040
12	State Oil Projects Company	1400
13	North Refinery Company	3170
14	Middle Refinery Company	1307
	Total	**42203**

Source: Ministry of Oil and Gas in Iraq (2009)

3.5.2 Sample Size

Sample size can be defined as the subset of a population required to ensure significant results (Sekaran & Bougie, 2010). The sample size refers to the number of units required to obtain accurate findings (Fink, 2002). Sampling is usually preferred instead of data collection from every element of the population because of the former's practicality

(Sekaran, 2003; Zikmund, 2003). The selection of a sample will result in a more successful outcome because of the reduction in fatigue and in potential errors from the data collected, especially when a large number of elements are involved (Sekaran, 2003).

Gay and Diehl (1992) state that determining the correct sample size is crucial for generalization purposes. According to Zikmund *et al.* (2010), as sample size increases, the likelihood of the error generally decreases. Pallant (2007) also mentions that although the consensus among scholars about the sample size is limited, a larger sample is proven to represent the population better. Meanwhile, a small sample tends to conclude unreliable correlation coefficients and thus defeats the purpose of the study. Therefore, relatively huge samples are always inclined yield statistically significant results. Based on the rule of thumb, a sample size between 30 and 500 can be considered effective depending on the sampling design and on the research question investigated (Roscoe, 1975). A sample size that is several times larger (ten times) than the number of variables in multivariate studies is often required (Curran–Everett, Taylor, & Kafadar, 1998).

Based on the findings by Krejcie and Morgan (1970), the present study identified a sample size of 380 employees who met the population inclusion criteria set forth in this study. As mentioned previously, in multivariate analysis, the sample size should be several times larger than the number of variables. With 15 variables in the present study, the required sample size should be at least 150. Thus, a population size of 380 subjects can be considered appropriate for this study.

3.5.3 Sampling Technique

Area sampling was used for the selection of the study sample. This method is the most popular type of cluster sampling, especially when the research design covers several geographical clusters (Sekaran, 2003). The objective of cluster sampling is to obtain the sample economically, while preserving the distinctiveness of a probability sample where the clusters are randomly selected (Zikmund *et al.*, 2010). Area sampling is an ideal technique when the cluster is heterogeneous (Bowen & Starr, 1987; Zikmund *et al.*, 2010). The cluster in this study can be considered heterogeneous because O&G companies employ individuals with various demographic backgrounds and traits, similar to those in the population. Furthermore, as the subjects are dispersed geographically in 14 different regions throughout the Republic of Iraq, cluster sampling is perceived to be the most appropriate sampling technique.

To implement the sampling technique chosen, this study followed the steps recommended by Gay and Diehl (1992). They suggest five steps, as follows:

1. Define the population. Here the population is 42,203 employees (see Table 3.1).
2. Define the sample size. The sample size of 380 is determined based on Krejcie and Morgan's (1970) formula.
3. Define a logical cluster. The logical cluster in this study is the company in O&G industry in Iraq throughout the country. There are14 companies involved in O&G in Iraq (see Table 3.1).

4. An average number of the population elements per cluster was then be estimated by dividing the population size (i.e. 42203) by the number of cluster (i.e. 14). This resulted in 3014.5 elements per cluster.
5. The number of clusters was determined by dividing the determined sample size (i.e. 380) by the estimated size of a cluster (3014.5), which resulted in 0.126 clusters or one company.

The adoption of this technique implies that one company, which represents a cluster, must be randomly selected. To choose one company out of 14 companies, simple random sampling was used. The name of the companies was written on different pieces of paper, from which one company was then randomly drawn. Through simple random sampling, the South Gas Company was selected. Data were then collected from all 1,330 employees of this company that met the definition of the population.

3.6 DATA COLLECTION PROCEDURE

Data collection is an essential component of quantitative research. The most common research instrument for data collection is a questionnaire survey. This study utilized a questionnaire survey as the primary data collection tool because of its effectiveness. A questionnaire enables respondents to provide the required data within a short period, while minimizing response bias (Sekaran & Bougie, 2010; Zikmund *et al.*, 2010).

Data were obtained from employees working in the Iraqi O&G industry who are directly at risk of occupational accidents. The questionnaires were personally administered to them. The main reason for distributing the questionnaires in this manner is to enable the researcher to explain the purpose and the benefits of the study and to encourage the participants to provide honest answers (Sekaran, 2003). In addition, personally administered surveys are more valid than low-cost interviews, as the former incurs less error than the latter (Creswell, 2012). Thus, a personally administered survey was found useful for the present study, which aims to acquire a high response rate that exceeds the consensual sample size required.

Prior to the distribution of the questionnaires, a request letter was forwarded to the General Directorate of Planning and Research of the Ministry of Oil and Gas of Iraq to explain the objectives and the intention of the researcher. Written approval was obtained from the Iraqi Ministry of Oil and Gas for the distribution of the questionnaires. After accomplishing all procedures to obtain the necessary approvals, the researcher visited the company and met with the Director of Human Resources, from whom permission was gained to distribute the questionnaire and to implement the plan as described in as follows:

1. The researcher formed a work team comprising four members to help in the distribution of the questionnaire because of the large sample size, and because the data were to be collected when the employees were having their lunch and/or dinner break. The team was made up of four research assistants, who had a bachelor’s degree, from the College of Business and Economics in Al-Basrah University. They were selected to assist in the present study because they had the knowledge and experience in research.

2. The appointed researchers visited the company's seven restaurants to distribute the questionnaires. Lunchtime for the employees in the morning shift was from 1 p.m. to 2 p.m., and dinnertime for the evening shift employees was from 8 p.m. to 9 p.m., during which the questionnaires were distributed. The researcher chose these time periods after discussion with the human resource manager. It was suggested that these time periods would be the most suitable time as data can be collected without affecting the company's daily operations. The team distributed the questionnaire to all the employees of the company who fit our definition of population, based on the list given by the human resource department.
3. The researcher explained the goals and nature of the study and gave a detailed explanation of the questionnaire using the sound system within the restaurant. The restaurant was an open buffet restaurant. It had 2500 chairs and 500 tables, which means that each table consisted of 5 chairs. This also means that the restaurant was big enough for all employees. The use of sound system was practical due to the sheer size of the restaurant. The employees were also asked to indicate whether they could hear the researcher or not. The whole procedure took around 30 minutes, in which the researcher spent around 5 minutes briefing the employees about the questionnaire. Then, the distribution of the questionnaire took about 10 minutes. The last 15 minutes were spent on completing and collecting the questionnaires.
4. The researcher distributed the questionnaires to the work team, who then distributed the questionnaires to the employees who were done eating. The

questionnaires were collected on the same day they were administered after giving adequate time for employees to fill in the questionnaire.

This process was repeated 14 times because the company has seven restaurants and two shifts, morning and evening. Questionnaires were administered and collected from October 2011 to December 2011.The researcher did not find any difference between the answers of the two shifts because all of the employees had the same task and the same working environment.

3.7 MEASUREMENT OF VARIABLES/ INSTRUMENTATION

Measurement of variables or instrumentation is a tool or mechanism for describing specific properties of the variables of interest in a study by assigning numbers in a reliable and valid manner (Creswell, 2012; Sekaran & Bougie, 2010; Zikmund *et al.*, 2010). This section presents the full detail on the measurement variable and the measurement scale.

3.7.1 Management Practices

Management practices are defined as the methods or techniques that are the most effective in achieving organizational goals through the optimum utilization of organizational resources (Dorji & Hadikusumo, 2006). This definition is in accordance with those employed by Johnston (2010) and Skjerve (2008). To measure management practices, a total of 31 items were used, which were adopted from Vredenburgh (2002), and from Vinodkumar and Bhasi (2010). A five-point Likert scale that ranged from "1" as “strongly disagree” to “5” as “strongly agree” was employed to measure all items. An average score was computed to determine the level of management practices. A high average score indicates favorable management practices. Six dimensions of management practices were examined, namely, safety training, rewards, management commitment, communication and feedback, hiring practices, and employee participation. Each dimension of management practices is discussed below.

3.7.1.1 Safety Training

Safety training is operationally defined as the acquisition of knowledge and technical skills that enhance safety performance for the prevention of accidents and injuries at the workplace (HSE, 2010). This definition conforms to those used by Quresh *et al.* (2010), Tavares (2009), and by Westmorland *et al.* (2005). Six items were used to measure safety training. Some examples of the items include “My company gives comprehensive training to employees on workplace health and safety issues,” and “Safety issues are given high priority in training programs.” The internal consistency reliability of the scale reported was 0.82 (Vinodkumar & Bhasi, 2010).

3.7.1.2 Rewards

A reward is operationally defined as items or conditions used to motivate employees to develop a positive attitude toward improving safety performance (Cabrera *et al.*, 2007). Three items were used to measure the reward variable. Some examples of the items include “I think that work-related injuries can be attributed to a lack of rewards for reporting hazards," and "I think employees are rewarded for reporting a safety hazard." The internal consistency reliability of the scale reported was 0.86 (Vredenburgh, 2002).

3.7.1.3 Management Commitment

Management commitment is operationally defined as the determination of the administration to pursue safety programs and to employ methods for the prevention of occupational accidents in the workplace (Arboleda *et al.*, 2003). Nine items were used to measure management commitment. Some examples of the items include "Safety is given high priority by the management" and "Management considers safety to be equally important as production". The internal consistency reliability of the scale reported was 0.86 (Vinodkumar & Bhasi, 2010).

3.7.1.4 Communication and Feedback

Communication and feedback is operationally defined as the provision of information and data on the safety level of an organization to identify the degrees of risk that result in accidents at the workplace (Bentley & Haslam, 2001). This definition is in accordance with that used by Kletz (1993). Five items were used to measure communication and feedback. Some examples of the items include "My company doesn't have a hazard reporting system where employees can communicate hazard information before incidents occur" and "There is open communications about safety issues in this workplace". The internal consistency reliability of the scale reported was 0.70 (Vinodkumar & Bhasi, 2010).

3.7.1.5 Hiring Practices

Hiring practices are operationally defined as a process of criteria development for hiring employees, which is conducted by selected personnel who have the ability to understand and who are aware of the safety process and its importance in the organization (Eckhardt, 1996). Three items were used to measure hiring practices. Some examples of the items include “I think the employees hired should be based on a good safety record in their previous position” and “I think that work-related injuries are due to a lack of hiring people who are safety conscious”. The internal consistency reliability of the scale reported was 0.86 (Vredenburgh, 2002).

3.7.1.6 Employee Participation

Employee participation is operationally defined as the involvement of individuals or groups of employees in the conduct of safety programs and in the decision-making process within the organization (Khan, 2010). Five items were used to measure employee participation. Some examples of the items include “Management always welcomes opinions from employees before making final decisions on safety-related matters,” and “My company has safety committees that consist of representatives from the management and among the employees.” The internal consistency reliability of the scale was 0.69 (Vinodkumar & Bhasi, 2010).

3.7.2 Leadership Style

Leadership style is operationally defined as the behavior pattern that an individual exhibits when attempting to influence the activities of others (Hersey, Blanchard, &

Johnson, 1996). Leadership style also refers to the particular preference displayed by those who are in positions of authority (Ferrer, 2009). A total of 15 items were used to measure leadership style, which were adopted from Bass and Avolio (1991). The instrument is called the Multifactor Leadership Questionnaire (MLQ). A five-point Likert scale that ranged from "1" as "strongly disagree" to "5" as "strongly agree" was employed to measure all items. Two dimensions of leadership, namely, transformational leadership and transactional leadership were examined. Each dimension of leadership is discussed below.

3.7.2.1 Transformational Leadership

Transformational leadership is operationally defined as the manner by which a leader influences changes in the attitudes of organization members and in building their commitment to changes in the organization's objectives (Yukl, 1999). A total of 10 items were used to measure transformational leadership. Some examples of the items include "Instills pride in me" and "Listens to my concerns." The internal consistency reliability of the scale reported was 0.95 (Ismail *et al.*, 2010).

3.7.2.2 Transactional Leadership

Transactional leadership is exhibited by an individual who identifies and clarifies job tasks to his followers or subordinates and communicates how the successful execution of these tasks will result in the acquisition of desirable job rewards (Bass, 1990). Five items were used to measure transactional leadership. Some examples of the items include

“Makes clear expectation” and “Will take action before problems are chronic”. The internal consistency reliability of the scale reported was 0.86 (Ismail *et al.*, 2010).

3.7.3 Personality Traits

Personality comprises the number of ways by which an individual reacts and interacts with others (Robbins, 2005). In addition, personality traits are defined as a dynamic set of characteristics of a person, which uniquely affect his or her cognition, motivation, and behavior in various situations (Ryckman, 2004). Furthermore, personality traits refer to the characteristics of an individual that reflect consistent patterns of feeling, thinking, and behaving (Pervin& John 2001). These traits reflect who we are and determine our affective, behavioral, and cognitive styles (Mount *et al.*, 2005). To measure personality traits, a total of 28 items were used, which were adopted from Bamber and Castka (2006). A five-point Likert scale that ranged from “1” as “very inaccurate” to “5” as “very accurate” was employed to measure all items. Five dimensions of personal traits were examined, namely, extraversion, conscientiousness, intellect, agreeability, and emotional stability. The succeeding sections explain each dimension of personality traits.

3.7.3.1 Extraversion

Extraversion is operationally defined as warmth, gregariousness and assertiveness, as well active and excitement-seeking behavior and positive emotions (Lazaridès *et al.*, 2010). Extraversion also refers to the tendency toward cheerfulness, sociability, and high interpersonal activity (Cooper, 2003; Krishnan & Lim, 2010). This definition conforms to that used by Goldberg (1990). Six items were used to measure extraversion. Some examples of the items include “I feel comfortable around people” and “I talk to many different people at parties.” The internal consistency reliability of the scale reported was 0.86 (Bamber & Castka, 2006).

3.7.3.2 Conscientiousness

Conscientiousness is operationally defined as the degree of reliability, diligence, caution, self-discipline, ambition, perseverance, and responsibility of an individual (Wallace & Chen, 2006). Conscientiousness also refers to efforts toward achievement, competence, deliberation, duty, order, and self-discipline (Lazaridès *et al.*, 2010). This definition agrees with that used by several scholars (e.g. Cellar *et al.*, 2001; Wallace & Vodanovich, 2003; Goldberg, 1992). Five items were used to measure conscientiousness. Some examples of the items include “I make a mess of things” and “I get chores done immediately.” The internal consistency reliability of the scale reported was 0.77 (Bamber & Castka, 2006).

3.7.3.3 Intellect

Intellect is operationally defined as creativity, open-mindedness, and willingness to experiment or to try new things (Molleman, Nauta, & Jehn, 2004). Intellect also refers to fantasy, aesthetics, feelings, actions, ideas, and values (LePine, 2003). This definition is in agreement with those used by several scholars (e.g. John & Sanjay, 1999; Neuman, Wagner, & Christiansen, 1999; McCrae & Costa, 1987; Skarlicki, Folger, & Tesluk, 1999). Five items were used to measure intellect. Some examples of the items include “I am quick to understand things" and "I spend time reflecting on things." The internal consistency reliability of the scale reported was 0.61 (Bamber & Castka, 2006).

3.7.3.4 Agreeableness

Agreeableness is operationally defined as the degree to which an individual is friendly, tolerant, helpful, altruistic, modest, trustworthy, and straightforward (Neuman & Wright, 1999). Agreeableness also refers to altruism, compliance, modesty, straightforwardness, tender-mindedness, and trust (Lazaridès *et al.*, 2010). This definition conforms to those used by Costa and McCrae (1992), and Digman (1990). Six items were used to measure agreeableness. Some examples of the items include "I am interested in other people's problems" and "I sympathize with the feelings of others." The internal consistency reliability of the scale reported was 0.74 (Bamber & Castka, 2006).

3.7.3.5 Emotional Stability

Emotional stability is operationally defined as the extent to which an individual is calm, enthusiastic, poised, and secure versus being depressed, angry, frustrated, and insecure (Hogan & Holland, 2003). Emotional stability also refers to an individual's level of anxiety, depression, hostility, impulsiveness, self-consciousness, and vulnerability (Zhao & Seibert, 2006). This definition is similar to those used by several scholars (Barrick *et al.*, 2001; Neuman *et al.*, 1999; Van Vianen & De Dreu, 2001). Six items were used to measure emotional stability. Some examples of the items include "I have frequent mood swings" and "I change my mood a lot." The internal consistency reliability of the scale reported was 0.85 (Bamber & Castka, 2006).

3.7.4 Safety Performance

Safety performance is operationally defined as the actions or behavior that individuals exhibit at work to promote the health and safety of workers (Burke *et al.*, 2002). This definition conforms to those used by several scholars (e.g. Mannan, O'Connor, & Keren, 2009; Siu *et al.*, 2004). Safety performance also refers to the level of safety that can minimize the number of accidents and injuries in the workplace (Neal & Griffin, 2006). To measure safety performance, a total of 16 items were used, which were adopted from Hayes *et al.* (1998), and Vinodkumar and Bhasi (2010). A five-point Likert scale that ranged from "1" as "strongly disagree" to "5" as "strongly agree" was employed to measure all items. Two dimensions of safety performance were examined, namely, compliance with safety behavior and safety participation. These dimensions are consistent with safety behavior (Burke *et al.*, 2002). The following subsections explain each dimension of safety performance.

3.7.4.1 Compliance with Safety Behavior

Compliance with safety behavior is operationally defined as the adherence to safety procedures and the manner of performing work in a safe manner (Neal *et al.*, 2000). A total of 11 items were used to measure compliance with safety behavior. Some examples of the items include "I keep my work equipment in safe working condition" and "I wear safety equipment as required." The internal consistency reliability of the scale reported was 0.67 (Hayes *et al.*, 1998).

3.7.4.2 Safety Participation

Safety participation is operationally defined as behavior that does not directly contribute to an individual's personal safety but helps to develop an environment that supports safety (Broadbent, 2004). An example of safety participation is the involvement in voluntary safety activities or attendance in safety meetings. This definition conforms to those used by several scholars (Griffin & Hart, 2000; Lu & Yang, 2010). Five items were used to measure safety participation. Some examples of the items include "I help my co-workers when they are working under risky or hazardous conditions" and "I always point out to the management if any safety related matters are noticed in my company". The internal consistency reliability of the scale reported was .66 (Vinodkumar & Bhasi, 2010).

3.7.5 Demographic Characteristics and Other Questions

Participants were asked about their demographic characteristics, including job title, gender, age, educational level, and marital status. Answers to these items were measured on a categorical scale. In addition, participants were asked to indicate whether they had been involved in an accident at work. If the answer is "yes", then they must describe how often similar accidents occur. They were also asked about their tenure in the present company. These additional questions were important to help the researcher understand the context of their work and to explain the phenomenon of safety performance better.

3.8 TRANSLATION OF THE QUESTIONNAIRES

The original questionnaire was prepared in English. However, since not all participants were able to understand the questions in English and because the language is not widely spoken in Iraq, the questions were translated into the Arabic language. Sekaran and Bougie (2010) suggested that the research instrument must in the language preferred by each respondent to avoid response errors. Thus, the questionnaire was translated using the back-translation method to ensure that an equivalence of measures is achieved in both Arabic and English (Brislin, 1970). The English version of the questionnaire was translated with the help of an expert in both languages. The translated version was then back-translated into English by another expert to enable the researcher to compare the translated version with the original version. The first version original and the back-translation version when compared there is no difference. Therefore, Arabic version was used. The English and the Arabic questionnaires are presented in Appendix A and B, respectively.

3.9 QUESTIONNAIRE DESIGN

The questionnaires were prepared in a booklet-type form. The questionnaire had 97 items, which were presented in five main sections, namely, demographic information, management practices, leadership styles, personality traits, and safety performance. According to Sudman and Bradburn (1982), a booklet-type questionnaire prevents pages from being lost or misplaced. In addition, the respondent can easily turn the pages. The respondents were asked to encircle the appropriate response for questions that are related to their profile. For multiple-choice questions related to other variables, respondents were instructed to encircle all appropriate responses.

In a highly structured questionnaire, a cover letter must be presented on the first page (Sudman & Bradburnm, 1982). The cover letter helps ensure that the respondents provide appropriate answers by explaining the importance and the objectives of the research, which is in the context of safety performance in the Iraqi O&G industry (see Appendix A).

3.10 PILOT STUDY

A pilot study is a primary test used to assess the goodness of measure, that is, reliability, before administering the final questionnaire (Sekaran & Bougie, 2010; Zikmund *et al.*, 2010). Furthermore, a pilot study is significant because it improves the format and the content of the questionnaire (Neuman, 1997; Trochim & Donnelly, 2006; Wiersma, 1993). Reliability refers to the stability and consistency of the measurement instrument. The common statistical test of reliability estimate is the Cronbach's alpha (Hair *et al.*, 2010; Sekaran & Bougie, 2010; Zikmund *et al.*, 2010). The Cronbach's alpha is considered good when the alpha coefficient is 0.80, acceptable when the value is .70, and poor when the value is .60 (Sekaran & Bougie, 2010).

According to Cooper and Schindler (2008), and Emory and Cooper (1991), the appropriate sample size of the pilot study is approximately 25 to 100 respondents. In the present study, before the final questionnaire was administered, a pilot test was conducted among 70 employees from an O&G company that was not selected through simple random sampling. The distribution and the collection of the questionnaires were personally administered by the researcher. Only 50 questionnaires were returned, which represented a 72% response rate. The Statistical Package for Social Science (SPSS) version 18 was used to test the Cronbach's alpha of the measurement instrument. Table 3.2 shows the reliability test results.

Table 3.2
Reliability Test Results of the Measurement Instrument

Variables	**Dimensions**	**No. of Items**	**Pilot Cronbach's alpha Value ≥.70**
Management practices	Safety training	6	0.83
	Reward	3	0.73
	Management commitment	9	0.80
	Communication and feed back	5	0.86
	Hiring practices	3	0.91
	Employee participation	5	0.90
Leadership styles	Transformational leadership	10	0.84
	Transactional leadership	5	0.83
Personality traits	Extraversion	6	0.75
	Conscientiousness	5	0.75
	Intellect	5	0.76
	Agreeableness	6	0.73
	Emotional stability	6	0.75
Safety performance	Compliance with safety behavior	11	0.75
	Safety participation	5	0.74

Table 3.2 shows that the reliability estimates ranged from .73 to .91, which were greater than the required .70 criterion that is generally regarded as sufficient for empirical research (Nunnally, 1978).Therefore, these items were summated to represent the study variable for subsequent analyses.

3.11 DATA ANALYSIS

Upon completion of data collection, a preliminary test was conducted to determine the response rate, inter-rater agreement, reliability, and validity of the study construct. Factor and reliability analyses were conducted to assess the validity and the reliability of the independent variables (i.e. management practices and leadership styles), and of the moderator variable, (i.e. personality traits). The response rate was determined by calculating the frequency and the percentage of response, the result of which was later compared with the sample size determined before data collection. Descriptive statistics, including mean, median, standard deviation, frequency, and percentage, were used to describe the main characteristics of the sample. Each step of the data analysis is explained below.

3.11.1 Factor Analysis

Factor analysis is a statistical modeling approach that was first developed and used by an English psychologist, Charles Spearman, in the study of unobservable and hypothetically existing variables (Raykov & Marcoulides, 2006). Similar to path analysis, available literature has shown that factor analysis also has a relatively long history in business research (Hair *et al.*, 2010; Hau & Marsh, 2004). As mentioned by Raykov and Marcouliedes (2006), Spearman (1904) proposed that the ability scores of known individuals are manifestations of general ability or general intelligence and of several other abilities, such as verbal or numerical abilities. These general and specific factors are combined to produce the currently known ability performance, which is an idea that was later labeled as the two-factor theory in human ability. As an increasing number of researchers became interested in the factor approach, the theory was later expanded to other factors. The corresponding analytic approach is called "factor analysis."

Factor analysis consists of a set of statistical techniques aimed at explaining the underlying structure of a data matrix (Hair *et al.*, 2010; Pallant, 2007). The core objective of this type of analysis is to categorize factors into more manageable categories (Sekaran, 2003). Factor analysis has two most commonly used approaches, namely, the exploratory approach (EFA) and the confirmatory approach (CFA). EFA is performed when the researcher is uncertain of the number of factors that exist in a set of variables, whereas CFA is performed when the researcher has theoretical expectations about the number of factors and the association between variables and factors. Therefore, CFA is appropriate for the examination of construct validity because it tests how well a researcher's "theory" about the factor structure fits actual observations (Zikmund *et al.*, 2010).

The aim for conducting factor analysis in the proposed study is to obtain a summary of the structures of different variables and to know underlying dimensions of the variables. Therefore, EFA is selected. Second, the need for factor analysis lies in the need to assign goodness of fit for the scales used because these scales are all modified from other research. Finally, factor analysis is also conducted to decrease the number of items used in the measurement of variables to minimize loss of information (Hair *et al.*, 2010).

Statistical measures that help assess the factor ability of data include the following:

1. The result of Bartlett's analysis of sphericity should be significant ($p < .05$) to determine the appropriateness of the factor analysis. In a given scenario, when the

associated probability is more than .05, a threat is present on the manifestation of the identified matrix that can make it useless for the next step in the analysis (Kinnear & Gray, 1994).

2. Kaiser–Meyer–Olkin (KMO) is a test that measures the adequacy of the sample, with index ranges from 0 to 1. For an effective factor analysis, then lowest KMO value should be .6 (Tabachnick & Fidell, 2007; Trochim, 2000). If the index is lower than .6, KMO becomes irrelevant. Similarly, Kinnear and Gray (1994) indicated that the value of KMO should be higher than .05 for the result to be suitable for further factor analysis. Hair *et al.* (2010) have a standard in interpreting KMO values: .90 indicates a marvelous result, .80 indicates a meritorious result, .70 indicates a middling result, .60 indicates a mediocre result, and .50 is acceptable but not recommended. A KMO value of below .50 is unacceptable.

3.11.2 Reliability Analysis

Reliability analysis assesses the degree of consistency between measurements of a variable (Hair *et al.*, 2010). Reliability can be described as the extent to which a variable or a set of variables is consistent in the terms of the item that it intends to measure (Hair *et al.*, 2010). If multiple measures are taken, consistency on the measures is achieved. Therefore, reliability is an indicator of a measure's internal consistency. According to Zikmund *et al.* (2010), reliability can only be measured when different measures yield the same result. Generally, reliability is inversely related to measurement error. When reliability increases, the interconnection between a construct and an indicator also increases. Thus, the construct explains more of the variance in each indicator (Hair *et al.*, 2010).

Normally, internal consistency is measured by a coefficient alpha. The most commonly applied estimate of reliability for a multiple-item scale is the computation of the average of all possible split-half reliability values (Zikmund *et al.*, 2010). Coefficient alpha ranges in value from "0" as "no consistency" to "1" as complete consistency (Hair *et al.*, 2010; Pallant, 2007; Zikmund *et al.*, 2010). All items yield corresponding values. The scales that have a coefficient alpha between .80 and .95 are considered to have very good reliability, whereas those with a coefficient alpha between .60 and .70 are considered to have fair reliability. In cases where the coefficient alpha is below .60, the scale is considered to have poor reliability (Zikmund *et al.*, 2010). As recommended by Nunnally (1978), the minimum level of reliability is .70. Values below .70 indicate a lower limit of acceptability (Hair *et al.*, 2010), whereas higher values indicate higher reliability (Pallant, 2007).

3.11.3 Descriptive Analysis

Descriptive analysis involves the use of statistics to describe the phenomena of interest (Bernard, 2006; Sekaran, 2003). In this study, descriptive statistics was obtained to identify the background information of the respondents. Pallant (2007) revealed that descriptive statistics aims to:

1. Depict the different attributes of the data;

2. Verify any violation of the principal assumptions for the statistical methods to be used in the study; and
3. Address particular research questions.

In this study, descriptive analysis was employed for interval-scaled variables by deriving the minimum and maximum of the mean, mode, median, standard deviation, and variance.

3.11.4 Correlation Analysis

Correlation analysis is a statistical method that describes the strength and the direction of the linear relationship between two variables (Pallant, 2007). The degree of correlation measures the strength and the importance of a relationship between variables. Correlation analysis is performed when the researcher must explain the direction of the interconnection between variables. Correlations show a positive interconnection when one variable increases and the other also increases, whereas a negative interconnection is observed when one variable increases and the other decreases (Pallant, 2007).

This study used the Pearson correlation to test the relationship between variables. The Pearson correlation coefficient, r, symbolizes the estimated strength of linear association and its direction between interval and ratio variables based on the sampling data, which varies over a range of +1 to -1 (Cohen, 2001). The symbols or the prefixes (+, -) specify the direction of the relationship (positive or negative), whereas the number represents the strength of the relationship (the closer to 1, the stronger the relationship; 0 = no relationship) (Cooper & Schindler, 2008).

3.11.5 Regression Analysis

Multiple regression analysis is a technique that can be used to examine the relationship between one continuous dependent variable and numerous independent variables. Generally, several methods of multiple regression analysis can be used, including standard, hierarchical or sequential, and stepwise regression (Tabachnick & Fidell, 2007; Pallant, 2007). Regression analysis also analyzes the relationship between variables and tests the hypothesis. Prior to running the test, five assumptions were considered, namely, normality, linearity of the relationship, independence of the error term, homoscedasticity, and multicollinearity (Coakes, Steed, & Dzidic, 2006; Hair *et al.*, 2010).

Normality refers to the score of each variable that is normally distributed. Normality can be verified through the score histograms of each variable (Hair *et al.*, 2010; Pallant, 2007). Linearity refers to the linear relationship between two variables. When considering a scatter plot of scores, linearity is exemplified by a rough straight line instead of a curve (Pallant, 2007). Homoscedasticity refers to the similarity among various scores in variables X and Y, such that when the scatter plot is examined, a fairly even blocked shaped figure is observed along its length (Hair *et al.*, 2010; Pallant, 2007). Multicollinearity refers to the integration between independent variables, which exists only when the independent variables are highly correlated (r = 0.9 and above) (Pallant, 2007). In identifying multicollinearity, one of the variables may be omitted, or a composite variable may be formed from the scores of two highly correlated variables (Pallant, 2007). Outliers are examined through casewise diagnostics, and those identified are excluded from further analysis (Hair *et al.*, 2010).

The assumptions of normality, linearity, and homoscedasticity were respectively verified through the residual scatter plot, histogram, and normal probability plot (P-P plot) of the regression standardized residuals (Coakes *et al.*, 2006; Hair *et al.*, 2010), whereas the independence of error was assessed by Durbin–Watson statistics. The value of Durbin–Watson should be between 1.50 and 2.50 to indicate independence of observation (Coakes *et al.*, 2006).

3.11.6 Hierarchical Multiple Regression

Hierarchical multiple regression analysis was utilized in this study to test whether the personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) moderate the relationship among management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation), leadership styles (transformational and transactional leadership), and safety performance (compliance with safety behavior and safety participation). The use of hierarchical multiple regressions to detect moderating effects has been recommended by Chaplin (1991), Cohen and Cohen (1983), Stone and Hollenbeck (1984), and by Zedeck (1971). In addition, Baron and Kenny (1986) suggested that the use of multiple regressions is the most appropriate for the detection of moderating effects.

Hierarchical multiple regression is thus used in the examination of the relationship between a set of independent and dependent variables using several independent variables to predict the dependent variables (Petrocelli, 2003). The essence of using hierarchical regression is to show the extent to which each independent variable predicts the dependent variables while controlling for all other independent variables in the regression equation (Constantine, 2001). The theoretically based decisions on how predictors are included in the analysis is referred to as hierarchical multiple regression. This method is specifically used to examine a certain theoretically based hypothesis (Cohen, 2001). According to Salami (2010), the interest of researchers is to test theoretical assumptions and to examine the sequential effect of several predicting variables, such that the importance of the predictor can be relatively judged on the basis of its effects on the criteria used in determining the prediction.

Furthermore, according to Petrocelli (2003), hierarchical multiple regression focuses on the changes in prediction ability that are associated with predictor variables entered in the latter part of the analysis and the those entered during the first part of the analysis.

3.12 SUMMARY

This chapter has described the research methodology used in the present study to investigate the relationship among management practices, leadership styles, personality traits, and safety performance in the Iraqi O&G industry. This chapter has presented the theoretical framework and developed the relevant hypotheses. Subsequently, the measurement of variables, survey instrument, translation, sampling, and data collection procedure have been detailed out. The process of verifying the reliability of the construct instruments based on the pilot study conducted prior to the actual study has also been explained. Finally, this chapter has described the methods of data analysis aimed at answering the research questions of this study. The succeeding chapter will discuss and analyze the findings of the current study.

CHAPTER FOUR

ANALYSIS AND FINDINGS

4.1 INTRODUCTION

This chapter presents the results of the data analyses. SPSS was used to analyze the data. The report on this chapter is based on the data provided by the participants through the questionnaire survey. The chapter is divided into four sections. The first section discusses the response rate and the descriptive statistics of the participants' demographic characteristics. The second section explains the goodness of measures. The third section presents the descriptive statistics of the variables, and intercorrelations between variables. The final section details a test used to identify violations of assumptions and the multivariate analysis used to test the hypotheses.

4.2 RESPONSE RATE

As mentioned in chapter the present study employed self-administered questionnaires to obtain data. The data for this study were collected from technicians, electrician, mechanics, welders, drillers, and engineers who are at risk of occupational accidents in the workplace, specifically in Iraqi O&G companies.

A total of 1,330 questionnaires were distributed to the South Gas Company in Iraq, 740 of which were returned and 27 of which were excluded because of several missing pieces of data per case. The cases with missing data were excluded when they comprised less than 5% of the total cases (Meyers, Gamst & Guarino, 2006). The final responses comprised 713 questionnaires, which represented 53.60% of the total number of questionnaires distributed. This response rate was considered adequate for the following reasons: Firstly, the data were collected in a self-administered manner, with no prior contact or personal connection made with the employees in the O&G company. Secondly, the total number of responses was greater than that suggested by Bartlett, Kotrllk and Higgins (2001) for regression type analysis, that is, the sample size should be between five and ten times the number of the independent variables. Thirdly, a review of the published social research literature suggests that a response rate of at least 50% can be considered adequate for analysis and reporting (Anderson *et al.*, 2009; Babbie, 2007). Table 4.1 shows the response rate and the number of usable questionnaires for this study.

Table 4.1
Response Rate of the Questionnaires

Response	**Frequency/Rate**
Number of distributed questionnaires	1330
Returned questionnaires	740
Returned and usable questionnaires	713
Returned and excluded questionnaires	27
Questionnaires not returned questionnaires	590
Response rate	55.63%
Usable response rate	53.60%

The response rate of this study is considered high compared to previous studies conducted in Iraqi O&G companies. Hussein (2008) achieved a 32% response rate, Al-Jubouri (2009) achieved a 44% response rate, Ali and Mohammed (2010) achieved a 49% response rate, and Abdullah (2011) achieved a 50% response rate. Table 4.2 below shows the response rate of previous studies on O&G companies in Iraq.

Table 4.2
Response Rates of Selected Studies O&G Companies in Iraq

Authors and year	Area of study	Level of analysis	Data collocation method	Response rate
Hussein (2008)	Marketing	Individual	Self-Administered Questionnaires	32%
Al-Jubouri (2009)	Organizational behavior	Individual	Self-Administered Questionnaires	44%
Ali and Mohammed (2010)	Accounting	Individual	Self-Administered Questionnaires	49%
Abdullah (2011)	Economic	Individual	Self-Administered Questionnaires	50%

4.3 DESCRIPTIVE STATISTICS OF PARTICIPANTS' DEMOGRAPHIC CHARACTERISTICS

This section describes the demographic factors of the participants who participated in the study. Prior to reporting the main findings of the survey, the demographic characteristics of the participants must be identified. The detection of out-of-range values can be achieved using descriptive analysis and the frequency method (Dillon, Madden, & Firtle, 1990). These methods were employed to provide an overall assessment of the population of employees in Iraqi O&G companies.

Demographic characteristics include job, gender, age, education, marital status, accidents encountered, and experience. Table 4.3 indicates that majority of the participants were engineers (22.9%). Other participants were mechanics (18.9%), welders (17.0%), technicians (15.3%), electricians (14.6%), and drillers (11.4%).

As regards to the gender of the participants, most of them were male (83.9%), while only 16.1% were female. This observation indicates the dominance of male employees in O&G companies, which is similar to most Iraqi industries, such as the iron and steel, petrochemical, and chemical fertilizer industries because of working conditions that are characterized by a high degree of risk and by considerable difficulty in the nature of work, which requires high energy, patience, and endurance.

In the terms of age, results showed that the highest number of participants were 31 to 40 years old (34.9%), followed by the age group of 20 to 30 years old (27.8%), 41 to 50 years old (23.7%), and 51 years old and above (13.6%). Thus, majority of the participants had considerable work experience. For the education level of participants, 42.6% of them had secondary school certificate, 34.1% had an O&G certificate, 10.8% had Bachelor's degree, 5.6% had Master's degree, and 3.9% had diploma. The rest of the participants (2.9%) had Ph.D. For the marital status, majority of the participants (48.7%) were married, 36.5% were single, and 14.9% were either divorced or widowed.

In the terms of occupational accidents encountered, 577 participants (80.9%) encountered occupational accidents since they started working, while 136 participants (19.1%) had not encountered any occupational accidents previously. With the current company, approximately 29.6% of the participants had exposure to nine and 15 occupational accidents, while 22.9% of the participants had exposure to more than 15 occupational accidents. Additionally, 19.6% of participants had exposure to four and eight occupational accidents. The rest of the participants (8.8%) had exposure to one to three occupational accidents.

For the participants' working experience, the results ranged from 1 to 5, 6 to 10, 11 to 15, 16 to 20, and over 20 years. A total of 203 (28.5%) participants had 6 to 10 years of working experience, 200 (28.1%) had 11 to 15 years, 167 (23.4%) had 16 to 20 years, 101 (14.2%) had 1 to 5 years, and 42 (5.9%) had over 20 years of working experience.

Table 4.3

Descriptive Statistics of Participants' Demographic Factors

Demographic	Characteristics	Frequency	Percentage %
Job Title	Technicians	109	15.3
	Electrician	104	14.6
	Mechanics	135	18.9
	Welders	121	17.0
	Drillers	81	11.4
	Engineers	163	22.9
Total		**713**	**100.0**
Gender	Male	598	83.9
	Female	115	16.1
Total		**713**	**100**
Age	20 -30 years	198	27.8
	31- 40 years	249	34.9
	41 – 50 years	169	23.7
	Over 50	97	13.6
Total		**713**	**100.0**
Educational level	Higher school	304	42.6
	Certificate in O&G	243	34.1
	Bachelor's degree	77	10.8
	Diploma	28	3.9
	Master's degree	40	5.6
	PhD	21	2.9
Total		**713**	**100.0**
Marital Status	Married	347	48.7
	Single	260	36.5
	Divorced/widowed	106	14.9
Total		**713**	**100.0**
Exposure to Occupational Accident	Yes	577	80.9
	No	136	19.1
Total		**713**	**100.0**
The Number of Occupational Accidents	Yes (1 – 3)	63	8.8
	Yes (4 – 8)	140	19.6
	Yes (9 – 15)	211	29.6
	Yes (Over 15)	163	22.9
	No	136	19.1
Working Experience	1-5	101	14.2
	6-10	203	28.5
	11-15	200	28.1
	16-20	167	23.4
	Over 20	42	5.9
Total		**713**	**100.0**

4.4 GOODNESS OF MEASURE

4.4.1 Construct Validity

Construct validity or factorial validity determines how well the results fit the theories based on which the test was designed (Malhotra, 2004). Construct validity verifies whether the instrument tapped the concept as theorized. The more construct validity is used, the higher the construct validity is. Before further tests were performed, the construct was subjected to validity and reliability tests. Factor analysis was performed to test the construct of the items in the questionnaire. The purpose was basically to identify a small number of themes, dimension components, or factors underlying a relatively large set of variables (Meyers *et al.*, 2006). Given that one item represents a part of a construct, a group of items is required to explain this construct. Moreover, factor analysis enables a researcher to develop quality items to determine construct validity. Given that factor analysis deals with items that are correlated to one another, it explains an item with any specific dimension. Hence, factor analysis allows only reasonable and viable variables to be used (Hair *et al.*, 2010).

The total number of usable questionnaires for factor analysis was 713, which was greater than the minimum number suggested by Arrindell and Ende (1985), Hair *et al.* (2010), Cokes and Steed (2003), and by Bartlett, Kotrlik, and Higgins (2001) for the purpose of conducting factor analysis. In the present study, 90 items were investigated. The 713 responses were considered satisfactory for a single factor analysis to be conducted. Therefore, a separate factor analysis was performed on all items measured on an interval scale. Four constructs were tested for validity, namely, management practices, leadership styles, personality traits, and safety performance. The following section reports and discusses the construct validity of the study variables.

4.4.2 Factor Analysis for Management Practices and Leadership Styles

The dimensions of the independent variables were measured using 46 averaged items that were answered by participants in the Iraqi South Gas Company. A principal component factor analysis using varimax rotation was conducted to determine which of the 46 items should be grouped to form dimensions. Seven items were deleted because of cross-loading. The criterion developed by Igbaria *et al.* (1995) was adopted in the present study for cross-loading. A given item should load 0.50 or higher on a specific factor, and the loading should be no higher than 0.35 on other factors. The final factor analysis was conducted on the remaining 39 items. The analysis was an eight-factor solution based on six dimensions for management practices and two dimensions for leadership styles. The results are presented in Table 4.4.

Table 4.4

Factor Analysis Summary of Independent Variable

Items	Component 1	2	3	4	5	6	7	8
Factor 1: Transformational leadership								
1. Listens to my concerns.	**0.748**	-0.011	0.012	0.025	0.025	0.07	-0.006	0.046
2. Encourages me to perform.	**0.821**	-0.014	0.013	-0.044	0.072	0.069	0.063	0.123
3. Increases my motivation.	**0.8**	0.03	-0.003	-0.02	0.159	0.123	0.014	-0.013
4. Encourages me to think more creatively.	**0.849**	0.015	0.011	-0.022	0.103	0.079	0.028	0.064
5. Sets challenging standards.	**0.871**	-0.003	0.014	-0.009	0.11	0.064	-0.036	0.069
6. Gets me to rethink never-questioned ideas.	**0.794**	0.031	-0.025	0.003	0.095	0.125	-0.004	0
Factor 2: Safety Training								
1. My company gives comprehensive training to the employees in workplace health and safety issues.	0.031	**0.806**	-0.021	0.009	-0.006	0.045	0.022	0
2. Newly recruits are trained adequately to learn safety rules and procedures.	-0.021	**0.781**	0.017	0.004	0.05	-0.002	0.009	-0.004
3. Safety issues are given high priority in training programs.	0.105	**0.754**	0.054	-0.08	-0.007	-0.018	-0.034	0.006
4. I am not adequately trained to respond to emergency situations in my workplace.	-0.009	**0.756**	0.05	-0.03	-0.023	-0.026	0.044	-0.025
5. Management encourages the workers to attend safety training programs.	-0.044	**0.829**	-0.028	0.007	-0.015	0.036	0.072	0.053
6. Safety training given to me is adequate to enable to me to assess hazards in workplace.	-0.021	**0.819**	-0.025	0.054	0.027	0.071	0.134	0.034

Table 4.4 (Continued)

Items	Component 1	2	3	4	5	6	7	8
Factor 3: Management commitment								
1. Corrective action is always taken when the management is told about unsafe practices	-0.001	0.025	**0.74**	-0.027	0.076	0.048	-0.021	0.039
2. Management considers safety to be equally important as production.	0.006	-0.056	**0.747**	0.015	-0.008	0.085	0.01	0.014
3. Members of the management do not attend safety meetings	0.009	0.054	**0.784**	0.031	-0.048	0.081	0.026	-0.048
4. I feel that management is willing to compromise on safety for increasing production	0.039	0.033	**0.769**	0.03	-0.043	0.058	0.075	-0.092
5. When near-miss accidents are reported, my management acts quickly to solve the problems	-0.017	-0.016	**0.855**	-0.018	-0.003	0.015	0.069	0.04
6. My company provides sufficient personal protective equipment for the workers.	-0.018	0.015	**0.782**	0.048	0.035	-0.11	0.019	0.022
Factor 4: Communication and feedback								
1. My company doesn't have a hazard reporting system where employees can communicate hazard information before incidents occur.	0.006	0.015	0.071	**0.813**	-0.016	-0.02	0.006	0.109
2. Management operates an open door policy on safety issues.	-0.009	-0.051	-0.002	**0.803**	0.089	0.005	0.037	-0.076
3. There is sufficient opportunity to discuss and deal with safety issues in meetings.	-0.047	-0.004	0.021	**0.858**	0.007	0.047	0.006	0.116

Table 4.4 (Continued)

Items	Component							
	1	2	3	4	5	6	7	8
4. The target and goals for safety performance in my organization are not clear to the workers.	-0.002	0.009	-0.004	**0.837**	-0.003	0.089	0.032	0.06
5. There is open communications about safety issues in this workplace.	-0.006	-0.012	-0.006	**0.851**	0.046	0.065	0.039	-0.023
Factor 5: Transactional leadership								
1. Makes clear expectation.	0.093	0.047	0.045	0.053	**0.753**	0.035	-0.03	0.067
2. Will take action before problems are chronic	0.17	-0.029	-0.048	0.009	**0.826**	0.012	0.021	-0.049
3. Tells us standards to carry out work.	0.126	0.003	0.016	0.018	**0.775**	0.002	0.067	-0.007
4. Works out agreements with me.	0.011	0.026	0.05	0.035	**0.799**	-0.001	0.053	0.051
5. Monitors my performance and keeps track of mistake.	0.115	-0.028	-0.058	0.003	**0.794**	0.048	0.055	-0.029
Factor 6: Employee participation								
1. Management always welcomes opinion from employees before making final decisions on safety related matters.	0.054	0.035	0.055	0.041	0.076	**0.847**	0.003	0.087
2. My company has safety committees consisting of representatives of management and employees.	0.052	0.029	0.109	0.034	0.032	**0.771**	0.055	0.099
3. Management promotes employees involvement in safety related matters.	0.108	0.042	0.043	0.011	0.062	**0.861**	-0.032	0.092
4. Management consults with employees regularly about workplace health and safety issues.	0.131	0.009	0.008	0.027	-0.036	**0.618**	-0.033	0.092

Table 4.4 (Continued)

Items	**Component**							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
5. Employees do not sincerely participate in identifying safety problems	0.125	-0.015	-0.025	0.062	-0.019	**0.73**	-0.002	0.083
Factor 7: Hiring practices								
1. I think the employees hired should be based on a good safety record in their previous position.	0.042	0.11	0	0.073	0.016	-0.017	**0.806**	0.049
2. I think the management seeks to have information about job candidates' prior safety performance in selecting or transferring employees.	0.01	0.092	0.065	-0.004	-0.008	-0.003	**0.881**	-0.027
3. I think that work-related injuries are due to a lack of hiring people who are safety conscious.	-0.003	0.015	0.102	0.043	0.044	0.006	**0.888**	-0.022
Factor 8: Reward								
1. I think that work-related injuries are due to a lack of rewards for reporting hazards.	0.082	0	-0.022	0.05	0.018	0.134	-0.009	**0.801**
2. I think the employees are rewarded for reporting a safety hazard (e.g., thanked, have employee recognized in hospital newsletter, receive cash or other awards).	0.064	0.014	-0.02	0.022	0.055	0.136	0.061	**0.756**
3. I think the employees are punished for reporting a safety hazard (e.g., they are ignored or told to keep it quiet).	0.093	0.038	0.021	0.092	-0.041	0.16	-0.052	**0.755**
Eigen values	5.29	4.02	3.78	3.51	3.05	2.45	2.10	1.58
Percentage of Variance Explained = 66.018%	13.54	10.29	9.68	9.01	7.82	6.28	5.38	4.04

The output in Table 4.4 shows that the KMO measure of sampling adequacy for the eight-dimension solution was 0.811, with a significant result for Bartlett's test of Sphericity (Sig = 0.000). The KMO measure of sampling adequacy is an index used to examine the appropriateness of factor analysis, which should be greater than 0.5 for the analysis to be considered satisfactory. Bartlett's test of Sphericity is examined if the subscales of the scale are inter-independent (Kaiser, 1974). This finding indicates that the data were suitable for factor analysis (Coakes& Steed, 2003; Hair *et al.*, 2010). The variance is 66.018% with eight extracted factors. Hair *et al.* (2010) reported that in social science research, a solution that accounts for 60% or, in some instances even less than the total variance is commonly considered to be satisfactory.

The first factor consisted of six items and explains 13.54% of the variance in leadership styles. The second factor consisted of six items and explained 10.29% of the variance in management practices. The third factor consisted of six items and explained 9.68% of the variance in management practices. The fourth factor consisted of five items and explained 9.01% of the variance in management practices. The fifth factor consisted of five items and explained 7.82% of the variance in leadership styles. The sixth factor consisted of five items and explained 6.28% of the variance in management practices. The seventh factor consisted of three items and explained 5.38% of the variance in management practices. The last factor consisted of three items and explained 4.04% of the variance in management practices.

The management practices adopted by Vredenburgh (2002) and by Vinodkumar and Bhasi (2010) suggested six factors to measure safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation. In addition, the leadership styles adopted by Ismail *et al.* (2010) suggested two factors to measure transformational and transactional leadership. The results of the factor analysis provided support that management practices and leadership styles are meaningful in a theoretical sense. Responses to 28 questions were summed to form an index of management practices, and responses to 11 questions were summed to index leadership styles.

4.4.3 Factor Analysis for Personality Traits

The summary of factor analysis for the personality trait construct was derived from the 28 items adopted. The items included 10 negatively worded items, which were reverse-coded. A principal component factor analysis using varimax rotation was then conducted on the 28 items to determine which items should form dimensions. Three items were deleted because of cross-loading. The criteria developed by Igbaria *et al.* (1995) was used in the present study for cross-loading, which indicated that a given item should load 0.50 or higher on a specific factor and obtain a loading of no higher than 0.35 on other factors.

As indicated in Table 4.5, the 25 items achieved more than 0.5 communalities and were loaded on five factors. The KMO measure of sampling adequacy for the five dimensions was 0.828, with the Chi-square of the Bartlett's test of Sphericity at

11436.839 and the degree of freedom at 300, which was significant at 0.000. The variance was explained by 66.04%, with an eigenvalue of extracted factors of more than 1. This value indicates that the data were suitable for factor analysis (Coakes & Steed, 2003: Hair *et al.*, 2010; Meyers *et al.*, 2006).

The analysis yielded five factors based on the criteria. The output in Table 4.5 shows that the first factor (emotional stability) consisted of six items and explained 19.98% of the variance in personality traits for employees. The second factor (intellect) consisted of five items and explained 16.81% of the variance in personal traits. The third factor (agreeableness) consisted of four items and explained 10.77% of the variance in personal traits of employees. The fourth factor (conscientiousness) consisted of five items and explained 10.13% of the variance in personal traits. The fifth factor (extraversion) consisted of five items and explained 8.36% of the variance in personal traits. The personal traits adopted by Bamber and Castka (2006) suggested five factors to measure extraversion, conscientiousness, agreeableness, intellect, and emotional stability.

In this study, principal component analysis using varimax rotation showed a general support for this model with minor expectations. The original measure consisted of five dimensions with 28 items, but the final factor analysis loaded 25 items into five factors. The responses for these 25 questions were summed to form an index of personality traits.

Table 4.5

Factor Analysis Summary of Moderator Variables

Items	Component 1	2	3	4	5
Factor 1: Emotional Stability					
1. I worry about things.	**0.719**	0.018	-0.091	-0.024	0.034
2. I get upset easily.	**0.743**	0.03	-0.086	-0.011	0.039
3. I change my mood a lot.	**0.932**	0.018	0.046	0.008	-0.054
4. I have frequent mood swings.	**0.699**	0.095	0.003	-0.038	-0.012
5. I get irritated easily	**0.929**	-0.021	0.031	0.001	-0.053
6. I often feel blue.	**0.902**	-0.008	0.032	-0.01	-0.082
Factor 2: Intellect					
1. I have a vivid imagination.	0.078	**0.88**	0.14	0.12	0.015
2. I am quick to understand things.	0.125	**0.864**	0.081	0.087	0.001
3. I use difficult words.	0.002	**0.791**	0.049	0.078	-0.023
4. I spend time reflecting on things.	-0.034	**0.829**	0.141	0.079	0.03
5. I am full of ideas.	-0.008	**0.863**	0.192	0.072	0.034
Factor 3: Agreeableness					
1. I feel concern for other.	0.004	0.327	**0.766**	0.069	0.075
2. I am interested in others	-0.058	0.129	**0.905**	0.011	0.036
3. I rarely insult people.	0.006	0.117	**0.892**	0.104	0.046
4. I sympathize with others' feelings.	-0.036	0.06	**0.827**	0.016	0.093
Factor 4: Conscientiousness					
1. I am always prepared	-0.024	0.065	-0.043	**0.8**	-0.005
2. I pay attention to details.	0.024	0.096	-0.106	**0.722**	0.016
3. I make a mess of things.	0.009	0.067	0.165	**0.742**	0.078
4. I get chores done right away.	-0.052	0.05	0.067	**0.772**	0
5. I like order	-0.035	0.117	0.128	**0.786**	0.122
Factor 5 Extraversion					
1. I feel comfortable around people.	0.039	-0.02	0.067	0.048	**0.728**
2. I start conversations.	-0.057	-0.067	0.038	-0.022	**0.588**
3. I talk to a lot of different people at parties.	-0.015	0.007	0.096	0.018	**0.794**
4. Keep in the background.	-0.041	0.002	-0.006	0.015	**0.647**
5. I have little to say.	0.005	0.165	0.024	0.146	**0.715**
Eigen values	4.10	4.21	2.69	2.53	2.09
Percentage of Variance Explained = 66.038%	19.98	16.81	10.77	10.13	8.36
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.828					
Bartlett's Test of Sphericity Approx. Chi-Square = 11436.839; df =300 ; Sig.= .000					

4.4.4 Factor Analysis for Safety Performance

Table 4.6 presents the results of the underlying safety performance measure. A principal component factor analysis using varimax rotation was conducted on 16 items to determine which items should be grouped to form dimensions. Eight items were deleted because of cross-loading, and the remainder achieved more than 0.5 communalities and loaded on two factors. The criteria developed by Igbaria *et al.* (1995) was used in the present study for cross-loading, which indicated that a given item should load 0.50 or higher on a specific factor and obtain a loading of no higher than 0.35 on other factors.

The output in Table 4.6 shows that the KMO measure of sampling adequacy for the dimensions was 0.829, with the Chi-square of Bartlett's test of Sphericity at 3642.193 and the degree of freedom at 28, which was significant at 0.000. This value indicates that the data are suitable for factor analysis (Coakes & Steed, 2003; Hair *et al.*, 2010). The variance was explained by 75.03%, with two factors extracted and an eigen value of more than 1.

The findings in Table 4.6 show that the first factor (compliance with safety behavior) consisted of six items and explained 54.63% of the variance in safety performance. The second factor (safety participation) consisted two items and explained 20.40% variance in safety performance. The safety performance adopted by Hayes *et al.* (1998) and by Vinodkumar and Bhasi (2010) suggested two factors to measure compliance with safety performance and participation. The factor analyses were examined and were found to attain the necessary statistical assumptions, as indicated by their high KMO measure.

Table 4.6
Factor Analysis Summary of Dependent Variables

Items	Component 1	Component 2
Factor 1: Compliance with Safety Behavior		
1. I overlook safety procedures in order to get my task done more quickly.	**0.842**	0.073
2. I follow all safety procedures regardless of the situation I am in.	**0.797**	0.155
3. I handle all situations as if there is a possibility of having an accident.	**0.86**	0.092
4. I wear safety equipment required by practice.	**0.831**	0.082
5. I keep my work area clean.	**0.764**	0.163
6. I do not follow safety rules that I think are unnecessary.	**0.86**	0.098
Factor 2: Safety Participation		
1. I help my co-workers when they are working under risky or hazardous conditions.	0.136	**0.945**
2. I always point out to the management if any safety related matters are noticed in my company.	0.114	**0.949**
Eigen values	4.37	1.64
Percentage of Variance Explained = 75.03%	54.63	20.40
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.829		
Bartlett's Test of Sphericity Approx. Chi-Square = 3642.193; df=28 ; Sig.=.000		

4.5 RELIABILITY ANALYSIS

Scale reliability was assessed in term of items-to-total correlation. The Cronbach's alpha was used to determine the internal consistency of the measurement scale. Reliability is a type of association used to correlate a variable with itself and is typically used to assess inter-rater similarity on a variable. In addition, reliability can simply be defined as "consistency." Babbie (2001) revealed that despite the repeated application of the same procedures, reliability should obtain the same results for the same study. However, the measurement is considered reliable if it yields the same results when the same technique is applied repeatedly on the same participants over various periods of time. The reliability of the scale can be measured by the Cronbach's alpha, which ranges from 0 to 1. According to Hair *et al.* (2010), a value of 0.7 is the generally accepted alpha value for research. Parasurman, Berry, and

Zeithaml (1991), and Reimer and Kuehn (2005) mentioned that a high Cronbach's alpha is as an indirect indicator of convergent validity. Meanwhile, Nunnally and Bernstein (1994) reported that the value of the Cronbach's Alpha should be >0.70. A higher Cronbach's is better. Cronbach's alpha of <0.60 is considered poor. Values in the 0.70 range are considered acceptable, whereas those >0.80 are considered good (Sekaran & Bougie, 2010).

In this study, the Cronbach's alpha was computed to ascertain the internal consistency of the measured items. Results of the reliability test for each factor were summarized after each factor analysis. The Cronbach's alpha coefficient was applied for each variable, and the findings are presented in Table 4.7. The internal consistency of the scales ranged from 0.71 (reward) to 0.92 (transformational leadership and safety participation), which suggests that the specified indicators are sufficient for use (Nunnally, 1978).

Table 4.7
Cronbach's Alphas of the Study Variables after Factor Analysis

Dimensions	**Original number of items**	**Number of final items**	**Alpha**
Safety training	6	6	.89
Reward	3	3	.71
Management commitment	9	6	.88
Communication and feedback	5	5	.89
Hiring practices	3	3	.84
Employee participation	5	5	.83
Transformational leadership	10	6	.92
Transactional leadership	5	5	.86
Extraversion	6	5	.74
Conscientiousness	5	5	.83
Intellect	5	5	.91
Agreeableness	6	4	.89
Emotional stability	6	6	.90
Compliance with safety behavior	11	6	.91
Safety participation	5	2	.92

4.6 DESCRIPTIVE STATISTICS OF VARIABLES

The variables were subjected to descriptive statistics to identify their characteristics. Specifically, mean, standard deviation, as well as maximum and minimum values were computed. The researchers used descriptive statistics to measure central tendencies and dispersions of the data set through the values obtained for the mean, standard deviation, and maximum and minimum values (Meier & Brudney, 2002; Doane & Seward, 2007; Dielman, 2005; Kazmier, 1996; Sekaran, 2003). These statistical tools can be more appropriate for interval-scale variables (Sekaran, 2003; Coakes& Steed, 2003). The function of the mean value is to measure the central tendency location of the data set, which is commonly assumed as the average (Meier & Brudney, 1987; Kazmier, 1996). Standard deviation measures the dispersion of data that deviate around the mean (Webster, 1998). The minimum and maximum values are used to check for errors in data entry (Doane & Seward, 2007; Nachmias & Nachmias, 1976).

The general descriptive statistics of the variables used in this study was examined. Descriptive analysis was conducted for the dependent variable (safety performance), independent variables (management practices and leadership styles), and moderator variable (personality traits). Descriptive statistics pertaining to management practices had six dimensions, namely, safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation. The results in Table 4.8 revealed that the dimension of management practices with the highest mean score was reward (3.43), which can be considered moderate, with a standard deviation of 0.803, minimum score of 2.00, and maximum score of 5.00. The lowest dimension of management practices with the lowest mean score was safety training (2.89), which can be considered low, with a standard deviation of 0.872 and the minimum and the maximum scores of 1.00 and 5.00, respectively.

Table 4.8 demonstrates the results of the descriptive statistics pertaining to the dimensions of leadership styles. The mean of transformational leadership was relatively higher than that of transactional leadership. The mean score of transformational leadership was 3.29, which can be considered rather moderate, with a standard deviation of 0.782. The minimum and the maximum scores were 1.83 and 5.00, respectively. The mean of transactional leadership was 3.27, which can be considered rather moderate as well, with a standard deviation of 0.739, and minimum and maximum scores of 1.80 and 5.00, respectively.

The findings on descriptive statistics indicated that the dimension of personality traits with the highest mean score was extraversion (3.44), which can be considered rather moderate, with a standard deviation of 0.695 and the minimum and maximum scores of 1.80 and 5.00, respectively. The dimension of personality traits with the lowest mean score was conscientiousness (2.89), which can be considered rather low, with a standard deviation of 0.738 and minimum and maximum scores of 1.00 and 4.60, respectively.

Descriptive statistics also provide information on safety performance dimensions. The mean of safety participation was relatively higher than that of compliance with safety behavior. The mean score of compliance with safety behavior was 3.30, which can be considered rather moderate, with a standard deviation of 0.807. The minimum and the maximum scores were 2.00 and 5.00, respectively. The mean score for safety participation was 3.56, which can be considered rather moderate as well, with a standard deviation of 0.809 and minimum and maximum scores of 1.50 and 5.00, respectively.

Table 4.8
Results of Descriptive Statistics of all Dimensions (n=713)

Dimensions	Mean	Standard Deviation	Minimum	Maximum
Management practices[a]				
Safety training	2.89	.872	1.00	5.00
Reward	3.43	.803	2.00	5.00
Management commitment	3.08	.876	1.00	5.00
Communication and feedback	3.31	.804	1.60	5.00
Hiring practices	3.17	.939	1.00	5.00
Employee participation	3.36	.760	1.80	5.00
Leadership styles[a]				
Transformational leadership	3.29	.782	1.83	5.00
Transactional leadership	3.27	.739	1.80	5.00
Personality traits [b]				
Extraversion	3.44	.695	1.80	5.00
Conscientiousness	2.89	.738	1.00	4.60
Intellect	3.25	.908	1.20	5.00
Agreeableness	3.23	.920	1.25	5.00
Emotional Stability	3.27	.807	1.67	5.00
Safety performance [a]				
Compliance with safety behavior	3.30	.807	2.00	5.00
Safety participation	3.56	.809	1.50	5.00

Note:
[a] 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.
[b]1 = very inaccurate, 2 = moderately inaccurate, 3 = neither accurate nor inaccurate, 4 = moderately accurate, 5 = very accurate.

4.7 INTERCORRELATION BETWEEN VARIABLES

A correlation analysis was conducted to explain the relationships among all variables in the study. The Pearson correlation was used to examine the correlation coefficient among the variables. Variable association refers to a wide variety of coefficients that measure the strength of a relationship and is defined in various ways. In common usage, "association" pertains to measures of the strength of a relationship in which at least one of the variables relates to the others. Additionally, a Pearson correlation matrix indicates the direction, strength, and significance of a bivariate relationship among all variables that are measured at an interval or ratio level (Creswell, 2012; Sekaran & Bougie, 2010; Hoel & Jessen, 1982).

Correlation is symmetrical and does not provide evidence on the way toward which causation flows. To the extent that a nonlinear relationship exists between two variables being correlated, correlation may understate the relationship (Morgan, Leech, Gloeckner, & Barrett, 2004). Correlation may also be attenuated to the extent of an existing measurement error, including the use of sub-interval data or artificial truncation of the range of data. Correlation can also be a misleading average if the relationship varies depending on the value of the independent variable, thus lacking homoscedasticity (Pallant, 2005).

A correlation coefficient is a statistic that ranges from -1.00 to +1.00. In a perfect correlation, movement within one variable is matched by a corresponding movement in the other variable. In addition, the closer the correlation is to one end of the range, the stronger the relationship between two variables is (Royse, 2004). Meanwhile, a correlation coefficient of 0 indicates the absence of a relationship between two variables. Therefore, correlation is a bivariate measure of the association (strength) of the relationship between two variables. Correlation ranges from 0 (random relationship) to 1 (for a perfect linear relationship) or -1 (for a perfect negative linear relationship).

Previous studies (Richardson *et al.*, 2005; Nelson & Mwaura, 1997; Kazmier, 1996; Sekaran, 2000; Wijewardena & Cooray, 1996) stated that the Pearson correlation coefficient is best used for interval-scaled and ratio-scaled variables. The Pearson correlation coefficient is generally accepted for the interpretation of two variables that are significantly correlated if the value of *p* is less than the value of the alpha level (Kirkpatrick & Feeney, 2005). Furthermore, Richardson *et al.* (2005) identified that if independent and dependent variables are correlated, constructing the model may be useful. Table 4.9 exhibits the correlation test results among the independent, moderating, and dependent variables.

Table 4.9 shows positive and significant relationships between independent variables (safety training, reward, management commitment, communication and feedback, hiring practices, employee participation, transformational leadership, and transactional leadership) and the dependent variable of compliance with safety behavior ($p<0.05$). The strongest positive correlation was demonstrated in the relationships between compliance with safety behavior and employee participation (r=0.207), reward and compliance with safety behavior (r =0.187), transactional leadership and compliance with safety behavior (r=0.177), communication and feedback and compliance with safety behavior (r=0.176), hiring practices and compliance with safety behavior (r=0.171), transformational leadership and compliance with safety behavior (r=0.153), management commitment and compliance with safety behavior (r=0.120), and safety training and compliance with safety behavior (r=0.115).

Table 4.9

Correlation Matrix between Management Practices, Leadership Styles, Personality and Safety Performance (N=713)

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1. Safety training	1														
2. Reward	0.039	1													
3. Management commitment	0.024	-0.003	1												
4. Communication and feedback	-0.015	.115**	0.037	1											
5. Hiring practices	.135**	0.002	.103**	0.071	1										
6. Employee participation	0.048	.299**	.080*	.092*	0.002	1									
7.Transformational leadership	0.022	.173**	0.012	-0.016	0.031	.236**	1								
8. Transactional Leadership	0.012	0.04	0.007	0.06	0.039	0.068	.241**	1							
9. Extraversion	-0.013	0.066	-0.047	0.071	-0.042	0.048	-0.021	0.041	1						
10. Conscientiousness	0.013	.137**	-0.007	0.03	-0.028	.130**	.116**	-0.02	.118**	1					
11. Intellect	0.041	-0.067	-0.015	0.008	-0.002	-0.061	-0.049	0.02	0.05	.211**	1				
12. Agreeableness	.080*	.134**	.096*	.084*	0.011	.109**	.080*	.098**	.138**	.138**	.319**	1			
13. Emotional Stability	-0.015	-0.053	-0.008	-0.03	0.054	-0.027	-0.03	-0.001	-0.05	-0.035	0.056	-0.033	1		
14. Compliance with safety behavior	.115**	.187**	.120**	.176**	.171**	.207**	.153**	.177**	0.042	.137**	0.028	.160**	-0.01	1	
15. Safety participation	.112**	.212**	.111**	.138**	.142**	.253**	.229**	.213**	.078*	.132**	-0.001	.170**	-.124**	.261**	1

Note:

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 4.9 also indicates positive relationships between independent variables (safety training, reward, management commitment, communication and feedback, hiring practices, employee participation, transformational leadership, and transactional leadership) and the dependent variable of safety participation, which were significant ($p<0.05$). The strongest positive correlations were found in the relationships between employee participation and safety participation (r=0.253), transformational leadership and safety participation (r=0.229), transactional leadership and safety participation (r=0.213), reward and safety participation (r=0.212), hiring practices and safety participation (r=0.142), communication and feedback and safety participation (r=0.138), safety training and safety participation (r=0.112), and management commitment and safety participation (r=0.111).

A positive relationship was also shown between the moderating variables [agreeableness (r=0.160) and conscientiousness (r=0.137)] and the dependent variable of compliance with safety behavior. The results also demonstrated a positive relationship between the moderating variables [agreeableness (r=0.170) and conscientiousness (r=0.132)] and the dependent variable of safety participation. In addition, the results indicated a negative relationship between the moderating variable of emotional stability and the dependent variable of safety participation (r=-0.124).

The results of the correlation analysis among the independent and dependent variables suggested a degree of support for the hypotheses of this study. Although the results of the correlation analysis were reliable, the statistical power was low. A correlation analysis of any magnitude or sign, regardless of its statistical significance, does not imply causation (Cooper & Schindler, 2003; Zikmund, 2003). Thus, correlation analysis provides no evidence of cause and effect. Cooper and Schindler (2003) stated that even when a coefficient is statistically significant, it must be practically meaningful. In numerous relationships, other study variables combine to make the coefficient's meaning misleading. To investigate the effects of various combinations of and interactions among variables, multivariate statistical analyses must be used. This kind of analysis can be applied when testing a more complex theoretical model. Multiple regression techniques are widely used, versatile, and helpful in sorting out confounding effects (Cooper & Schindler, 2003; Hair *et al.*, 2010). Hence, a multivariate analysis was conducted to test the hypotheses posited in this study.

4.8 TESTS FOR VIOLATIONS OF ASSUMPTIONS

Numerous modern statistical tests have been relying on some specified assumptions about the actual variable to be used in data analysis. Arguably, researchers and statisticians have confirmed the need to meet these basic assumptions for the research results to be trustworthy (Byrne, 2010; Hair *et al.,* 2010; Kline, 2011). A trustworthy result will prevent the occurrence of any type of errors. As noted by Hau and Marsh (2004), knowledge and general understanding of previous and current situations on the theory will be jeopardized in the presence of violations that may result in serious biases in the research findings. To satisfy underlying assumptions of multiple regression analysis, the variables were checked for outliers, normality, linearity, multicollinearity, homoscedasticity, and autocorrelations in accordance with the analysis suggested by Hair *et al.* (2010), Norusis (1999), and by Pallant (2005).

4.8.1 Outliers

Aside from univariate and bivariate outliers, multivariate outlier detection can also be performed to meet regression analysis assumptions. Several approaches can be used for the detection of outliers. In this study, the casewise diagnostic subcommand in SPSS was executed to identify multivariate outliers. Any cases of standardized residuals that are greater than three were excluded from further regression analysis (Tabachnick & Fidell, 2007).

4.8.2 Linearity

Another underlying assumption for regression analysis is that the relationship between independent and dependent variables is linear. To check for linearity, this study employed the residual scatter plot, where standardized residuals were plotted against predicted values. If the assumptions are satisfied, the residuals should scatter around zero, or most of the scores shall concentrate at the center along the zero point (Flury & Riedwyl, 1988). Appendix E demonstrates the scatter plot between the independent variables (management practices and leadership styles) and the dependent variables (compliance with safety behavior and safety participation). The plot indicated that the residual scores were concentrated at the center along the zero point, thus suggesting that the linearity assumption was met. Other variables also showed that the linearity assumption was not violated. According to Hair *et al.* (2010), if the analysis of residuals does not exhibit any nonlinear pattern, the overall equation is guaranteed to be linear and can be examined through residual plots. Appendix E does not exhibit any nonlinear pattern to the residuals, thus ensuring the linearity of the overall equation.

4.8.3 Normality

For every regression analysis, researchers always assume that the variables are normally distributed because a non-normally distributed variable may be highly skewed and can potentially distort the relationships between variables of interest and the significance of the test results (Hulland, 1999). Normality refers to the bell-shaped curve of the data distribution for an individual metric variable and its correspondence to a normal distribution (Hair *et al.*, 2010). A normality distribution of sample data is also depicted as a symmetrical bell-shaped curve that has the highest range of frequencies in the middle, with a smaller range of frequencies toward the extremes (Gravetter & Wallnau, 2000). After screening, the data are further examined to determine whether they are appropriate for the selected statistical technique. Checking for normality is an important step in multivariate analysis, as such an analysis requires a normal distribution of data (Tabachnich & Fidell, 2007). Given that statistical tests of significance are less useful in small samples and are quite sensitive in large samples**,** researchers are recommended to use both graphical plots and statistical tests to assess the actual degree of deviation from normality (Hair *et al.*, 2010).

Tabachnich and Fidell (2007) suggested that the normality of variables can be assessed by either statistical or graphical methods. However, they further argued that if the sample is large (200 or more cases), the shape of the distribution should be examined instead of using formal inference tests. Thus, this study examined both statistical and graphical methods because the sample was large with a total of 713 employees. Table 4.10 shows the results of the normality test for the variables. According to Hair *et al.* (2010), a critical value of less than -2.58 or greater than +2.58 indicates rejection on the assumption of normality at a 0.01 probability level. Meanwhile, a value of less than -1.96 or greater than +1.96 indicates rejection on the assumption of normality at a 0.05 probability level. Moreover, Kline (2011) stated that skewness values should be within ±3.00, and kurtosis values should be within ± 10.00.

Table 4.10
Normality Test Statistics of the Variables

Dimensions	**Skewness**	**Kurtosis**
Safety training	.248	-.571
Reward	-.016	-.670
Management commitment	-.271	-.295
Communication &feedback	.056	-.702
Hiring practices	-.126	-.589
Employee participation	.165	-.472
Transformational leadership	.318	-.282
Transactional leadership	.206	-.394
Extraversion	-.201	-.624
Conscientiousness	-.213	-.025
Intellect	-.085	-.508
Agreeableness	.124	-.602
Emotional stability	-.025	-.617
Compliance with safety behavior	.182	-.699
Safety Participation	-.140	-1.086

Table 4.10 shows that the overall values of skewness and kurtosis were within the critical value. Skewness and kurtosis are the main tests that can be used to validate normality assumptions (Pallant, 2001). Skewness refers to the measure of normality assumptions that describes the balance of sample data distribution. That is, whether the

data are unbalanced and shifted to the right, to the left, or to the center and symmetrical with approximately the same shape on both sides. Kurtosis refers to the measure of normality assumptions obtained through a comparison with a “peakness” or “flatness” of the sample data distribution (Hair *et al.*, 2010). In the examination of skewness and kurtosis using SPSS v18, the analysis found that none of the variable items had skewness values greater than 0.318 and kurtosis values greater than -1.086. These results indicated that the sample data were consistent with the normality assumption required for further use in multivariate analysis. Given that the majority of the variables as a whole did not indicate any extreme values of skewness and kurtosis, no serious violation on the assumption of normality was committed for the multivariate test at the univariate level (Gao, Makhtarian, & Johnston, 2008; Hair *et al.*, 2010). In addition, the researcher used graphical methods, such as histogram and normal probability plot, which are illustrated in Appendix E.

4.8.4 Multicollinearity

Multicollinearity refers to the degree of correlation among independent variables that are highly correlated (above 0.90) among themselves (Hair *et al.*, 2010). Multicollinearity is also a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated (Tabachnick&Fidell, 2007). In this case, coefficient estimates may change significantly in response to small changes in the model or data. A multiple regression model with correlated predictors can indicate how well an entire group of predictors predicts the outcome variable (Cooper & Schindler, 2001).

As generally agreed, multicollinearity can be accomplished by testing the tolerance value and the variance inflation factor (VIF) (Pallant, 2001). The tolerance value is an indicator of dependent variable prediction that uses other independent variables in the regression equation. VIF is an indicator of other independent variables that have an impact on the standard error of a regression coefficient. VIF is the inverse of the tolerance value (Hair *et al.*, 2010). Multicollinearity exists when the results show a tolerance value below or equal to 0.10 and a VIF that is higher than or equal to 10 (Hair *et al.*, 2010; Sekaran & Bougie, 2010). From the tolerance value and VIF listed in Table 4.11, the multicollinearity among variables is found to be very low.

Table 4.11
Multicollinearity Test Based on Assessment of Tolerance and VIF Values

Independent Variables	**Tolerance**	**VIF**
Safety Training	.978	1.023
Reward	.889	1.125
Management Commitment	.982	1.019
Communication and Feedback	.970	1.031
Hiring Practices	.965	1.036
Employee Participation	.864	1.157
Transformational leadership	.879	1.138
Transactional leadership	.937	1.067

One important point that can be observed from the results in Table 4.11 is that the tolerance values ranged from 0.864 to 0.982, and the VIF values ranged from 1.019 to 1.157. Hence, the results confirmed that no multicollinearity existed in the interaction among the variables of this study.

4.8.5 Homoscedasticity

Homoscedasticity refers to the assumption that dependent variables have an equal level of variance across a range of predictor variables. Homoscedasticity is desirable because the variance of the dependent variable is not concentrated in a limited range of independent values. The violation of this assumption is called heteroscedasticity. Heteroscedasticity tends to underestimate the coefficient estimate and sometimes makes insignificant variables appear to be statistically significant (Hair *et al.*, 2010). As discussed by Osborne and Waters (2002), homoscedasticity can be checked through the "visual examination of a plot of the standardized residuals (the errors) by the regression standardized predicted value. Ideally, residuals are randomly scattered around 0 (the horizontal line) providing a relatively even distribution. Heteroscedasticity is indicated when the residuals are not evenly scattered around the line." In this study, this assumption was verified through the visual examination of a plot of standardized residuals (the errors) by the regression standardized predicted value. The scatter plots in Appendix F show that the residuals were randomly scattered around zero (the horizontal line). Thus, the homoscedasticity assumption was not violated.

4.8.6 Autocorrelations

Autocorrelation refers to the correlation of a time series with its own past and future values (Gao *et al.*, 2008). The Durbin–Watson coefficient (d) test is used for autocorrelation. The d-value ranges from 0 to 4. The value that is closest to 0 indicates extremely positive autocorrelation, the value that is closest to 4 indicates extremely negative autocorrelation, and the value that is closest to 2 indicates no serial autocorrelation (Myers, 1990). As a standard, the d-value should be between 1.5 and 2.5 to indicate independence of observations. Positive autocorrelation means that standard errors of the b-coefficients are significantly small. Negative autocorrelation means that standard errors are significantly large. The d-value has an associated p-probability value for various significance cut-offs, which is 0.05. For a given level of significance, such as 0.05, an upper and a lower d-value limit are indicated. Appendix F shows the Durbin–Watson d-value test, which exhibited 1.526 and 1.564 for two dimensions of the dependent variables. For a given series in the research model, the d-value is more than the upper limit and indicates an independence of error observations.

4.9 RESULTS OF MAIN AND INTERACTING EFFECTS

This section describes the testing of the hypotheses related to the main effects of management practices and leadership styles on safety performance. As mentioned in Chapter 3, a bivariate correlation was conducted to understand the relationship among management practices, leadership styles, and safety performance. In this section, a multiple regression analysis was performed to understand the main effect of management practices and leadership styles on safety performance. A hierarchical multiple regression analysis was also conducted to understand the moderating effects of personality traits on the relationship among management practices, leadership styles, and safety performance. To test the hypotheses developed for this study, the level of significance was set at $p < 0.05$ and $p < 0.1$ (Cooper & Schindler, 2003; Hair *et al.* 2010).

4.9.1 Statistical Test on the Main Effect of Management Practices and Leadership Styles on Compliance with Safety Behavior

To understand further the relationship among management practices, leadership styles, and compliance with safety behavior (i.e. hypotheses 1 to 1l), a multiple regression analysis was conducted. Multiple correlation (R), squared multiple correlation (R^2), and adjusted squared multiple correlation (R^2adj) indicate how well the combination of independent variables predicts the dependent variable. The results (presented in Appendix F) showed that the regression equation with all predictors was significant, with R=0.38, R^2 = 0.147, adjR^2 = 0.138, F = (15,704) = 15.202, and p < 0.001. All predictors accounted for 14.7% of the variation in the compliance with safety behavior. The significant F-test revealed that the relationship between the dependent and the independent variables was linear and that the model significantly predicted the dependent variable.

The F-test [F (15,704) = 15.202, p < .001] indicated an overall significant prediction in the dimensions of the independent variables to the dependent variables but lacked information on the importance of each independent variable dimension. Table 4.12 displays the relationship of the dependent variable (compliance with safety behavior) and the independent variables with the individual contribution of each predictor, which is presented by the standardized regression weight for each predictor within a regression equation (Green & Salkind, 2008). Among the eight predictors, hiring practices (β = 0.134), t = 3.769, p = 0.00) had the highest and the most significant standardized beta coefficient, which indicates that hiring practices were the most important dimension of management practices. Other important predictors in descending order were communication and feedback (β = 0.133, t = 3.77, p = 0.00) and transactional leadership (β = 0.133, t= 3.700, p = 0.00), employee participation (β = 0.124, t = 3.323, p = 0.01), reward (β = 0.144, t = 3.087, p = 0.02), management commitment (β = 0.088, t = 2.501, p = 0.013), safety training (β = 0.084, t = 2.379, p = 0.018), and transformational leadership (β = 0.067, t = 1.803, p = 0.072), which was not significantly related to compliance with safety behavior. Seven predictor dimensions influenced the dependent variable (compliance with safety behavior) in the hypothesized direction. While hypotheses 1a, 1b, 1c, 1d, 1e, 1f, and 2b were supported, hypothesis 2a was rejected.

Table 4.12
Multiple Regression Results between Independent Variables Dimensions and Compliance with Safety Behavior

Variables	**Dependent Variable Safety Performance**
Independent Variables	
Safety training	.084*
Reward	.114*
Management commitment	.088*
Communication and feedback	.133**
Hiring practices	.134**
Employee participation	.124**
Transformational leadership	.067
Transactional leadership	.133**
F value	15.202
R^2	.147
Adjusted R^2	.138
Durbin Watson	1.526

* p< 0.05, ** p < 0.01

4.9.2 Statistical Test on the Main Effect of Management Practices and Leadership Styles on Safety Participation

To understand further the relationship among management practices, leadership styles, and safety participation (hypotheses 2 to 2d), a multiple regression analysis was conducted. Multiple correlation (*R*), squared multiple correlation (R^2), and adjusted squared multiple correlation (adjR^2) indicate how well the combination of independent variables predicts the dependent variable. The results (presented in Appendix F) showed that the regression equation with all predictors was significant at $R = 0.42$, $R^2 = 0.174$, adj$R^2 = 0.164$, F= (18,704) = 18.5, and p< 0.001. All the predictors accounted for 17.4% of the variation in safety participation. The significant F-test revealed that the relationship between the dependent and the independent variables was linear and that the model significantly predicted the dependent variable.

Table 4.13
Multiple Regression Results between Independent Variables Dimensions and Safety Participation

Variables	**Dependent Variable Safety Performance**
Independent Variables	
Safety training	. 080*
Reward	.124**
Management commitment	.080*
Communication and feedback	.093**
Hiring practices	.105**
Employee participation	.156**
Transformational leadership	.129**
Transactional leadership	.155**
F value	18.504
R^2	.174
Adjusted R^2	.164
Durbin Watson	1.564

* p< 0.05, ** p < 0.01

The F-test [F (18,704) = 18.5 p < 0.001] indicated an overall significant prediction in the independent variable dimensions to the dependent variables but lacked information on the importance of each independent variable dimension. Overall, the result presented in Table 4.13 showed that eight predictor dimensions were found to have a statistically significant association with the dependent variable (safety participation). The employee participation dimension ($\beta = 0.156$, $t = 4.235$, $p = 0.00$) had the highest and the most significant standardized beta coefficient, which indicates that employee participation was the most important dimension in management practices to achieve safety performance. Other important predictors in descending order were transactional leadership ($\beta = 0.155$, $t = 4.387$, $p = 0.00$), transformational leadership ($\beta = 0.129$, $t = 3.520$, $p = 0.00$), reward ($\beta = 0.124$, $t = 3.399$, $p = 0.01$), hiring practices ($\beta = 0.105$, $t = 3.021$, $p = 0.03$), communication and feedback ($\beta = 0.093$, $t = 2.667$, $p = 0.08$), and safety training ($\beta = .080$, $t = 2.303$, $p = .022$), and management commitment ($\beta = .080$, $t = 2.327$, $p = .020$). Eight predictor dimensions influenced the dependent variable (safety participation) in the direction hypothesized. Hypotheses 1g, 1h, 1i, 1j, 1k, 1l, 2c, and 2d were supported.

4.9.3 Interaction Effect of Personal Traits with Management Practices and Leadership Styles on Compliance with Safety Behavior

This section presents the results of the interaction effects between personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability), management practices (safety training, reward, management commitment communication and feedback, hiring practices, and employee participation), leadership styles (transformational and transactional leadership), and safety performance (compliance with safety behavior).

To test the extent of moderation of personality traits on the relationship among management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation), leadership styles (transformational and transactional leadership), and safety performance (compliance with safety behavior), a hierarchical multiple regression analysis was performed. Management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation) and leadership styles (transformational and transactional leadership) were first to be included in step 1, followed by the moderator variable (personality traits) in step 2, and the interaction terms in step 3 of the regression model. Hypothesis 3 predicted that personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) moderate the relationship between management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation) and safety performance (compliance with safety behavior). Meanwhile, hypothesis 4 predicted that personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) moderate the relationship between leadership styles (transformational and transactional leadership) and safety performance (compliance with safety behavior).

Table 4.14 shows the result of the hierarchical multiple regression analysis using extraversion as the moderator variable in the relationship between management practices and leadership styles (independent variables) and compliance with safety behavior (dependent variable). The summary and the details of the results (presented in Appendix G) reflect that the standardized coefficients (betas) of the independent variables follow the following steps: The set of the independent variables at step 1 accounted for approximately 15.1% of the variance in compliance with safety behavior. All independent variable dimensions had significant main effects on the dependent variable (compliance with safety behavior). The predictors in descending order were communication and feedback ($\beta = 0.141$, $t = 3.998$, $p = 0.00$), hiring practices ($\beta = 0.139$, $t = 3.933$, $p = 0.00$), transactional leadership ($\beta = 0.133$, $t = 3.708$, $p = 0.00$), reward ($\beta = 0.119$, $t = 3.224$, $p = 0.01$), employee participation ($\beta = 0.114$, $t = 3.029$, $p = 0.03$), management commitment ($\beta = 0.084$, $t = 2.404$, $p = 0.016$), safety training ($\beta = 0.083$, $t = 2.368$, $p = 0.018$), and transformational leadership ($\beta = 0.073$, $t = 1.974$, $p = 0.049$). The moderator variable at step 2 accounted for approximately 15.2% of the variance in compliance with safety behavior. Extraversion was not significantly related to compliance with safety behavior ($\beta = 0.028$, $t = 0.805$, $p = 0.421$). At step 3, when the interaction terms were entered, a 3.1% increase in R^2 was observed. However, only two interactions were significant, thus partially supporting hypothesis 3. The interaction terms were between extraversion × management commitment ($\beta = 0.872$, $t = 4.009$, $p = 0.00$) and extraversion × hiring practices ($\beta = -0.498$, $t = -2.435$, $p = 0.015$). While hypotheses 3c and 3e were supported, hypotheses 3a, 3b, 3d, 3f, 4a, and 4b were rejected.

Table 4.14

Hierarchical Regression Analysis Using Extraversion as a Moderator in the Relationship between Management Practices, Leadership Styles and Compliance with Safety Behavior

Variables	Step 1	Step 2	Step 3
Model Variables			
Safety training	.083*	.083*	.279
Reward	.119**	.117**	.197
Management commitment	.084*	.086*	-.643**
Communication and feedback	.141**	.139**	.148
Hiring Practices	.139**	.140**	.556**
Employee participation	.114**	.112**	-.139
Transformational leadership	.073*	.075*	.302
Transactional leadership	.133**	.132**	.029
Moderator Variable (Extraversion)		.028	-.104
Interaction Terms			
Extraversion ×Safety training			-.235
Extraversion × Reward			-.105
Extraversion × Management commitment			.872**
Extraversion × Communication & feedback			-.002
Extraversion × Hiring practices			-.498*
Extraversion ×Employee participation			.346
Extraversion × Transformational leadership			-.298
Extraversion × Transactional leadership			.129
R^2	.151	.152	.183
Adjusted R^2	.141	.141	.163
R^2 Change	.151	.001	.031
Sig. F Change	.000	.421	.001
Durbin Watson	1.556	1.556	1.556

* p< 0.05, ** p < 0.01

As indicated in Table 4.14, extraversion significantly moderated the relationship between management commitment and compliance with safety behavior. Figure 4.1 shows that the relationship between management commitment and compliance with safety behavior is strongest in the case of employees with high extraversion traits and weakest in the case of employees with low extraversion. Employees with either high or low extraversion personality do not differ much with regards to compliance with safety behavior under condition of low management commitment. However, large differences were noted under conditions of high management commitment where employees that are extrovert found to be having higher compliance with safety behavior. In other words, under conditions of high management commitment, individuals possessing higher extraversion personality had better compliance with safety behavior than those with possessing low extraversion personality.

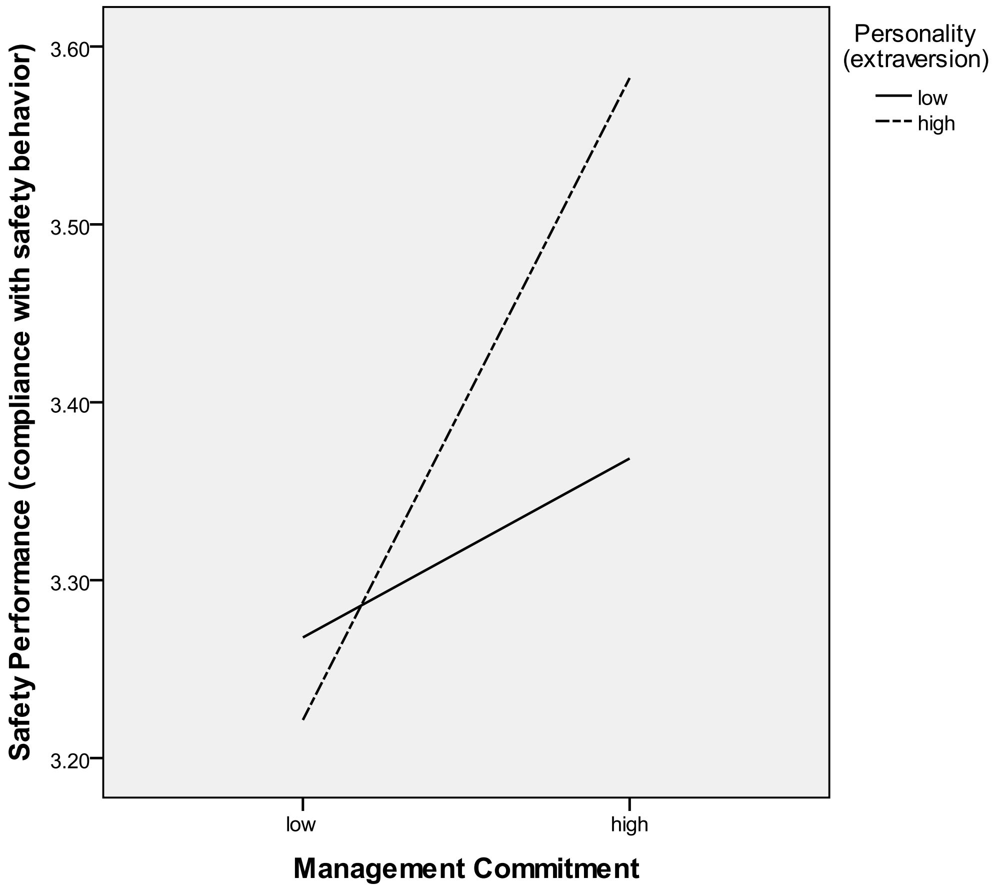

Figure 4.1
Plot of Interaction between Management Commitment and Extraversion on Compliance with Safety Behavior

Similarly, as indicated in Table 4.14, extraversion significantly moderated the relationship between hiring practices and compliance with safety behavior. Figure 4.2 shows that the relationship between hiring practices and compliance with safety behavior is strongest in the case of employees with high extraversion and weakest in the case of employees with low extraversion. Employees with either high or low extraversion personality did not differ much in compliance with safety behavior under condition of high hiring practice. However large differences were noted under conditions of low hiring practices where employees that are extrovert found to be having lower compliance with safety behavior. In other words, under conditions of low hiring practices, individuals whom possess high extraversion trait had better compliance with safety behavior than employees with low extraversion personality.

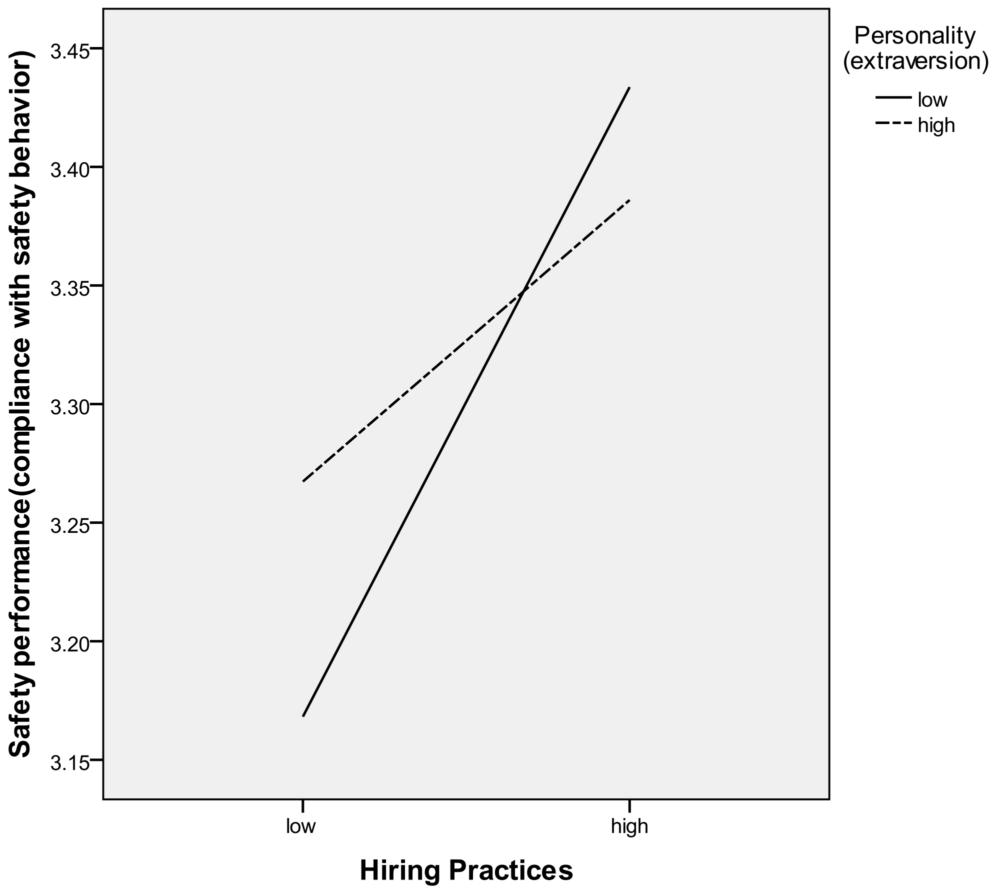

Figure 4.2
Plot of Interaction between Hiring Practice and Extraversion on Compliance with Safety Behavior

Table 4.15 presents the result of the hierarchical multiple regression analysis using conscientiousness as a moderator in the relationship between management practices and leadership styles (independent variables) and compliance with safety behavior (dependent variable). The summary and the details (presented in Appendix G) of the results reflect that the standardized coefficients (betas) of the independent variables are shown in the following respective steps. The set of the independent variables at step 1 accounted for approximately 14.7% of the variance in compliance with safety behavior. Table 4.15 also reveals that out of eight independent variable dimensions, seven dimensions had significant main effects on the dependent variable. The predictors in descending order were hiring practices ($\beta = 0.134$, $t = 3.769$, $p = 0.00$), communication and feedback ($\beta = 0.133$, $t = 3.773$, $p = 0.00$), transactional leadership ($\beta = 0.133$, $t = 3.700$, $p = 0.00$), employee participation ($\beta = 0.124$, $t = 3.323$, $p = 0.01$), reward ($\beta = 0.114$, $t = 3.087$, $p = 0.02$), management commitment ($\beta = 0.088$, $t = 2.501$, $p = 0.013$), and safety training ($\beta = 0.084$, $t = 2.379$, $p = 0.018$). Transformational leadership ($\beta = 0.067$, $t = 1.803$, $p = 0.072$) was not found to have significant main effects on compliance with safety behavior.

The moderator variable at step 2 accounted for approximately 15.7% of the variance in compliance with safety behavior. Conscientiousness was significantly related to compliance with safety behavior ($\beta = 0.103$, $t = 2.913$, $p = 0.04$). At step 3, when the interaction terms were entered, a 0.8% increase in R^2 was observed. However, only one interaction was significant, thus partially supporting hypothesis 3. The interaction terms were between conscientiousness × communication and feedback ($\beta = -0.453$, $t = -2.134$, $p = 0.033$). While hypothesis 3p was supported, hypotheses 3m, 3n, 3o, 3q, 3r, 4e, and 4f were rejected.

Table 4.15

Hierarchical Regression Analysis Using Conscientiousness as a Moderator in the Relationship between Management Practices, Leadership Styles and Compliance with Safety Behavior

Variables	**Step 1**	**Step 2**	**Step 3**
Model Variables			
Safety training	.084*	.083*	.094
Reward	.114**	.104**	.072
Management commitment	.088*	.089*	.039
Communication and feedback	.133**	.131**	.431**
Hiring practices	.134**	.137**	.087
Employee participation	.124**	.116**	.021
Transformational leadership	.067	.057	.308*
Transactional leadership	.133**	.138**	.113
Moderator Variable (conscientiousness**)**		.103**	.451
Interaction Terms			
Conscientiousness ×Safety training			-.014
Conscientiousness × Reward			.053
Conscientiousness × Management commitment			.059
Conscientiousness × Communication& feedback			-.453*
Conscientiousness × Hiring practices			.065
Conscientiousness × Employee participation			.153
Conscientiousness × Transformational leadership			-.399
Conscientiousness × Transactional leadership			.041
R^2	.147	.157	.166
Adjusted R^2	.138	.147	.145
R^2 Change	.147	.010	.008
Sig. F Change	.000	004	.542
Durbin Watson	1.525	1.525	1.525

* $p< 0.05$, ** $p < 0.01$

As indicated in Table 4.15, conscientiousness significantly moderated the relationship between communication and feedback and compliance with safety behavior. Figure 4.3 shows that the relationship between communication and feedback and compliance with safety behavior is strongest among the individuals whom display high conscientiousness and weakest among the individuals whom display low conscientiousness. Employees whom display either high or low conscientiousness personality did not differ much in compliance with safety behavior under condition of high communication and feedback, but large differences were noted under conditions of low communication and feedback. In other word, under conditions of low communication and feedback, individuals whom display high conscientiousness have better compliance with safety behavior than those whom display low conscientiousness.

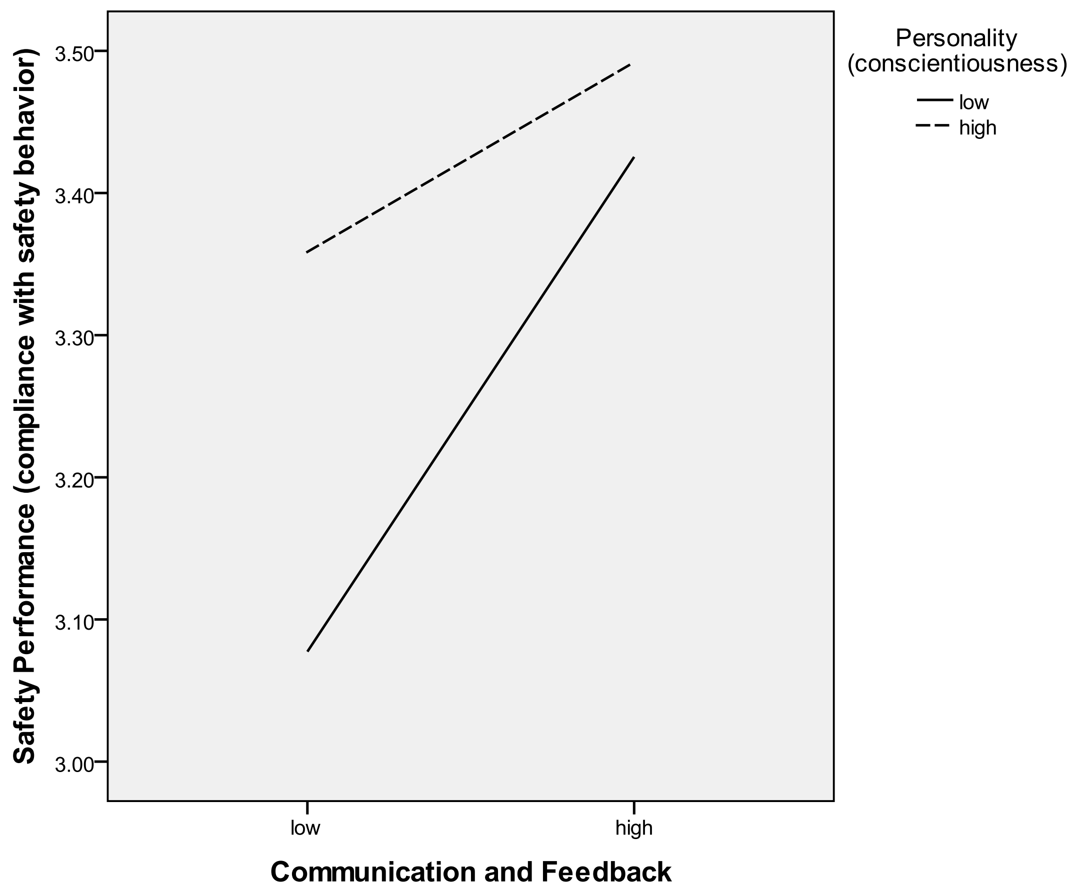

Figure 4.3
Plot of Interaction between Communication and Feedback and Conscientiousness on Compliance with Safety Behavior

Another test of hierarchical multiple regression was conducted to examine intellect as a moderator in the relationship among management practices, leadership styles, and compliance with safety behavior. Table 4.16 shows the standardized coefficients (betas) of the independent variables (presented in Appendix G) in the following respective steps: The set of the independent variables at step 1 accounted for approximately 14.7%

of the variance in compliance with safety behavior. Seven dimensions had significant main effects on the dependent variable. Only one dimension did not have a significant main effect on the dependent variable. The moderator variable at step 2 accounted for approximately 14.9% of the variance in compliance with safety behavior. Intellect was not significantly related to compliance with safety behavior. At step 3, when the interaction terms were entered, a 2.4% increase in R^2 was observed. However, only two interactions were significant, thus partially supporting hypotheses 3 and 4.The interaction terms were between intellect × communication and feedback ($\beta = -0.711$, $t = -3.534$, $p = 0.00$), and intellect × transactional leadership ($\beta = -0.507$, $t = -2.274$, $p = 0.023$). While hypotheses 3ab and 4j were supported, hypotheses 3y, 3z, 3aa, 3ac, 3ad, and 4i were rejected.

Table 4.16

Hierarchical Regression Analysis Using Intellect as a Moderator in the Relationship between Management Practices, Leadership Styles and Compliance with Safety Behavior

Variables	**Step 1**	**Step 2**	**Step 3**
Model Variables			
Safety training	.084*	.082*	.028
Reward	.114**	.116**	.186
Management commitment	.088*	.088*	-.092
Communication and feedback	.133**	.133**	.595**
Hiring practices	.134**	.134**	.222
Employee participation	.124**	.126**	.114
Transformational leadership	.067	.069	.295**
Transactional leadership	.133**	.132**	-.174
Moderator Variable (intellect**)**		.041	.377
Interaction Terms			
Intellect ×Safety training			.087
Intellect × Reward			-.089
Intellect ×Management commitment			.244
Intellect ×Communication & feedback			-.711**
Intellect × Hiring practices			-.122
Intellect × Employee participation			.005
Intellect ×Transformational leadership			-.358
Intellect × Transactional leadership			.507*
R^2	.147	.149	.173
Adjusted R^2	.138	.138	.153
R^2Change	.147	.002	.024
Sig. F Change	.000	.239	.009
Durbin Watson	1.541	1.541	1.541

* p< 0.05, ** p < 0.01

As indicated in Table 4.16, intellect significantly moderated the relationship between communication and feedback and compliance with safety behavior. Figure 4.4 shows that the relationship between communication and feedback and compliance with safety behavior is strongest among the individuals whom display high intellect personality and weakest among the individuals whom display low intellect personality. Individuals whom display either low or high intellect personality did not differ much in compliance with safety behavior under condition of high communication and feedback, but large differences were noted under conditions of low communication and feedback. In other words, under conditions of low communication and feedback, employees whom display high intellect personality have better compliance with safety behavior than those whom display low intellect personality.

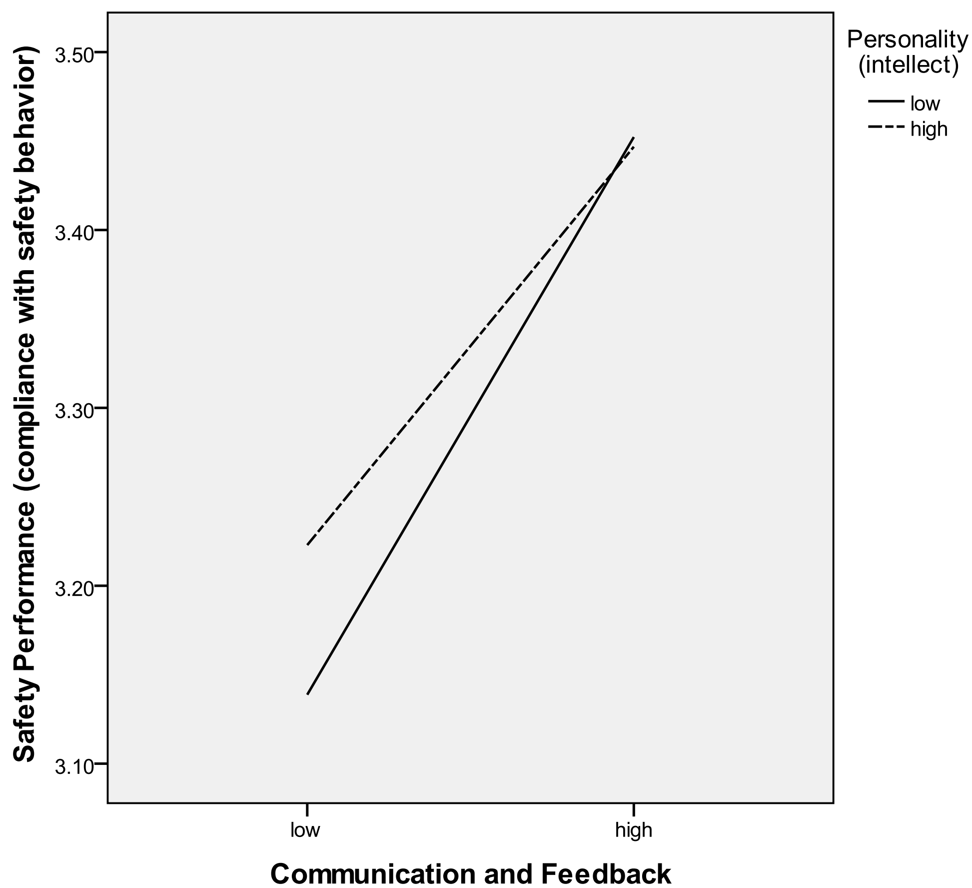

Figure 4.4
Plot of Interaction between Communication and Feedback and Intellect on Compliance with Safety Behavior

As also indicated in Table 4.16, intellect significantly moderated the relationship between transactional leadership and compliance with safety behavior. Figure 4.5 shows that the relationship between transactional leadership and compliance with safety behavior is strongest among the individuals whom display high intellect personality and weakest among the individuals whom display low intellect personality. In both situations either low or high transactional leadership individuals displaying high intellect personality have better compliance with safety behavior.

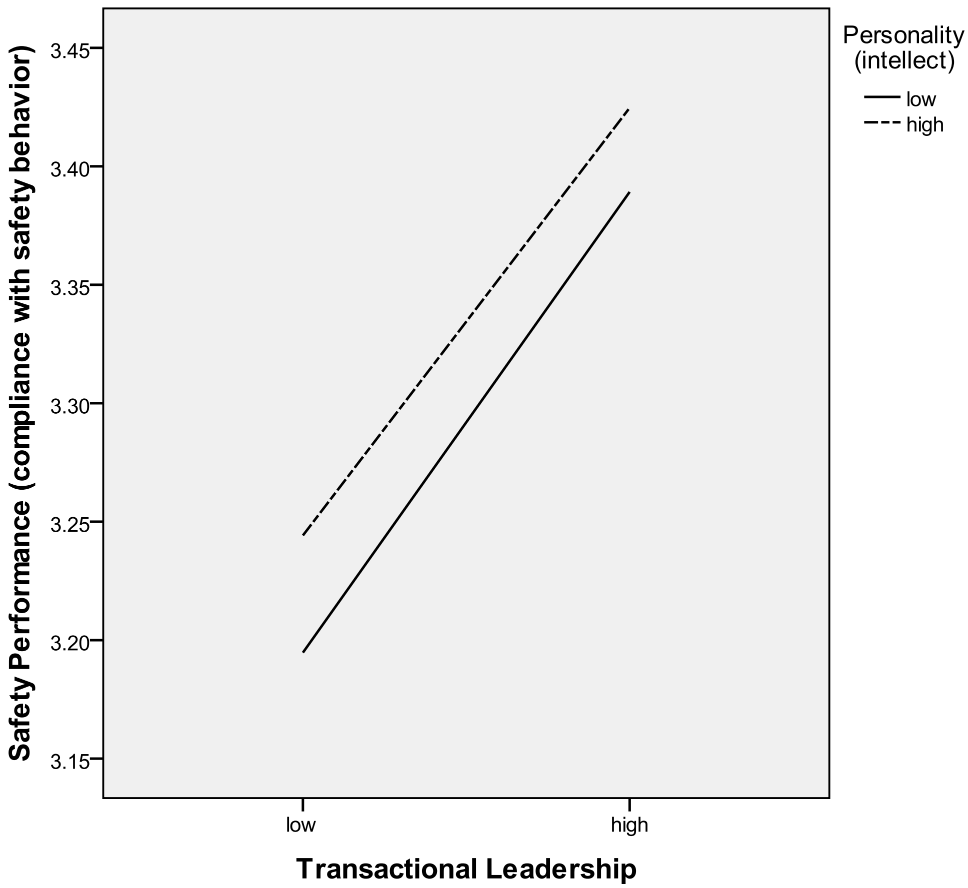

Figure 4.5
Plot of Interaction between Transactional Leadership and Intellect on Compliance with Safety Behavior

Table 4.17 shows the result of the hierarchical multiple regression analysis using agreeableness as a moderator in the relationship among management practices, leadership styles and compliance with safety behavior. The summary and the details (presented in Appendix G) of the results reflect that the standardized coefficients (betas) for independent variables. The set of the independent variables at step 1 accounted for approximately 15.3% of the variance in compliance with safety behavior. Table 4.17 also shows that out of eight independent variable dimensions, seven dimensions had significant main effects on the dependent variable. The predictors in descending order were hiring practices (β = 0.139, t = 3.923, p = 0.00), communication and feedback (β = 0.135, t = 3.843, p = 0.00), transactional leadership (β = 0.136, t = 3.789, p = 0.00), employee participation (β = 0.132, t = 3.546, p = 0.00), reward (β = 0.114, t = 3.109, p = 0.02), safety training (β = 0.089, t = 2.548, p = 0.011), and management commitment (β = 0.086, t = 2.465, p = 0.014). Transformational leadership (β = 0.063, t = 1.697, p = 0.090) had no significant main effects on the dependent variable.

The moderator variable at step 2 accounted for approximately 16.2% of the variance in compliance with safety behavior. Agreeableness was significantly related to compliance with safety behavior (β = 0.095, t = 2.697, p = 0.07). At step 3, when the interaction terms were entered, a 2.8% increase in $R^2$was observed. Two interactions were significant, thus partially supporting hypotheses 3 and 4. The interaction terms were between agreeability × reward (β = -0.647, t = -2.915, p = 0.04), and agreeableness × transactional leadership (β = 0.564, t = 2.700, p = 0.07). While hypotheses 3al and 4n were supported, hypotheses 3ak, 3am, 3an, 3ap, 3aq, and 4m were rejected.

As indicated in Table 4.17, agreeableness significantly moderated the relationship between rewards and compliance with safety behavior. Figure 4.6 shows that the relationship between reward and compliance with safety behavior is strongest among the individuals whom display high agreeableness and weakest among the individuals whom display low agreeableness. In both low and high reward condition individuals whom display high agreeableness personality have better compliance with safety behavior than individuals whom display low agreeableness personality.

Table 4.17
Hierarchical Regression Analysis Using Agreeableness as a Moderator in the Relationship between Management Practices, Leadership Styles and Compliance with Safety Behavior

Variables	**Step 1**	**Step 2**	**Step 3**
Model Variables			
Safety training	.089*	.083*	-.176
Reward	.114**	.105**	.494**
Management commitment	.086*	.078*	-.038
Communication and feedback	.135**	.130**	.207
Hiring practices	.139**	.140**	.030
Employee participation	.132**	.128**	.077
Transformational leadership	.063	.060	.160
Transactional leadership	.136**	.129**	-.197
Moderator Variable (agreeableness)		.095**	-.146
Interaction Terms			
Agreeableness ×Safety training			.364
Agreeableness × Reward			-.647**
Agreeableness × Management commitment			.163
Agreeableness × Communication and feedback			-.123
Agreeableness × Hiring practices			.149
Agreeableness × Employee participation			.092
Agreeableness × Transformational leadership			-.188
Agreeableness × Transactional leadership			.564**
R^2	.153	.162	.189
Adjusted R^2	.144	.151	.170
R^2Change	.153	.009	.028
Sig. F Change	.000	.007	.003
Durbin Watson	1.570	1.570	1.570

* $p< 0.05$, ** $p < 0.01$

Agreeableness significantly moderated the relationship between transactional leadership and compliance with safety behavior (Table 4.17). Figure 4.7 shows that the relationship between transactional leadership and compliance with safety behavior is strongest among the individuals whom display high agreeableness and weakest among the individuals whom display low agreeableness. In both low and high transactional leadership condition individuals whom display high agreeableness personality have better compliance with safety behavior than those whom display low agreeableness personality.

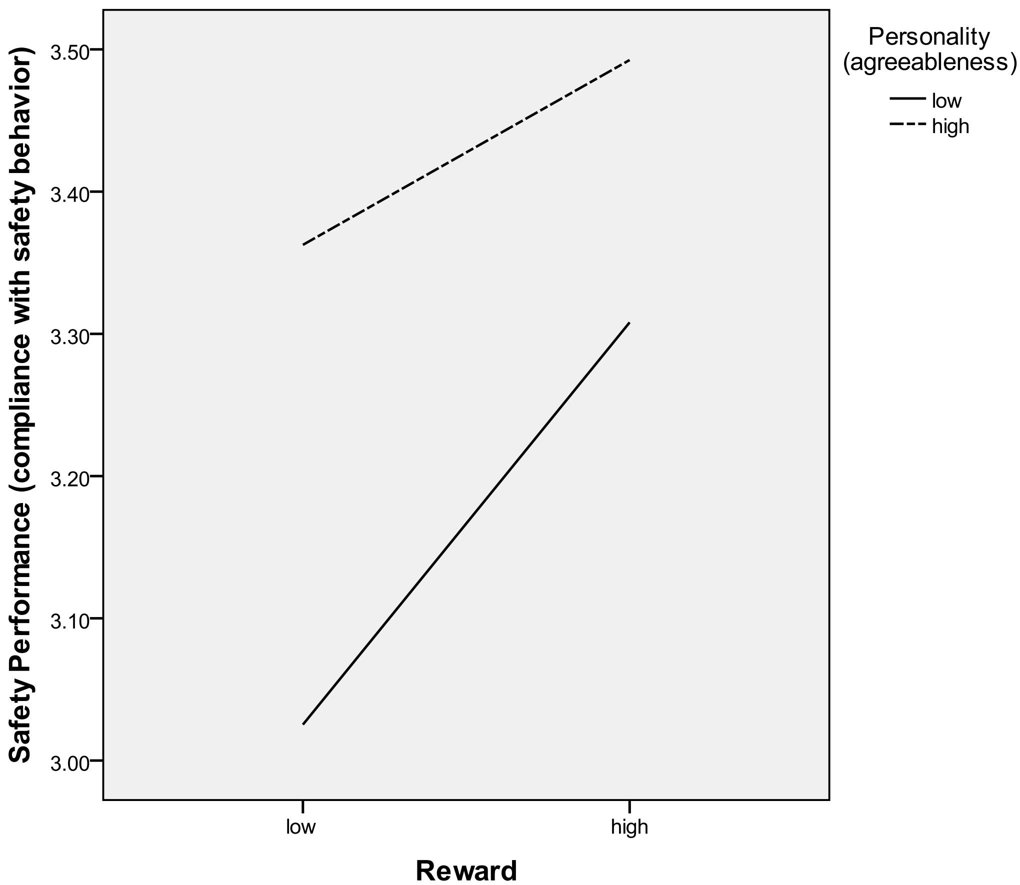

Figure 4.6
Plot of Interaction between Reward and Agreeableness on Compliance with Safety Behavior

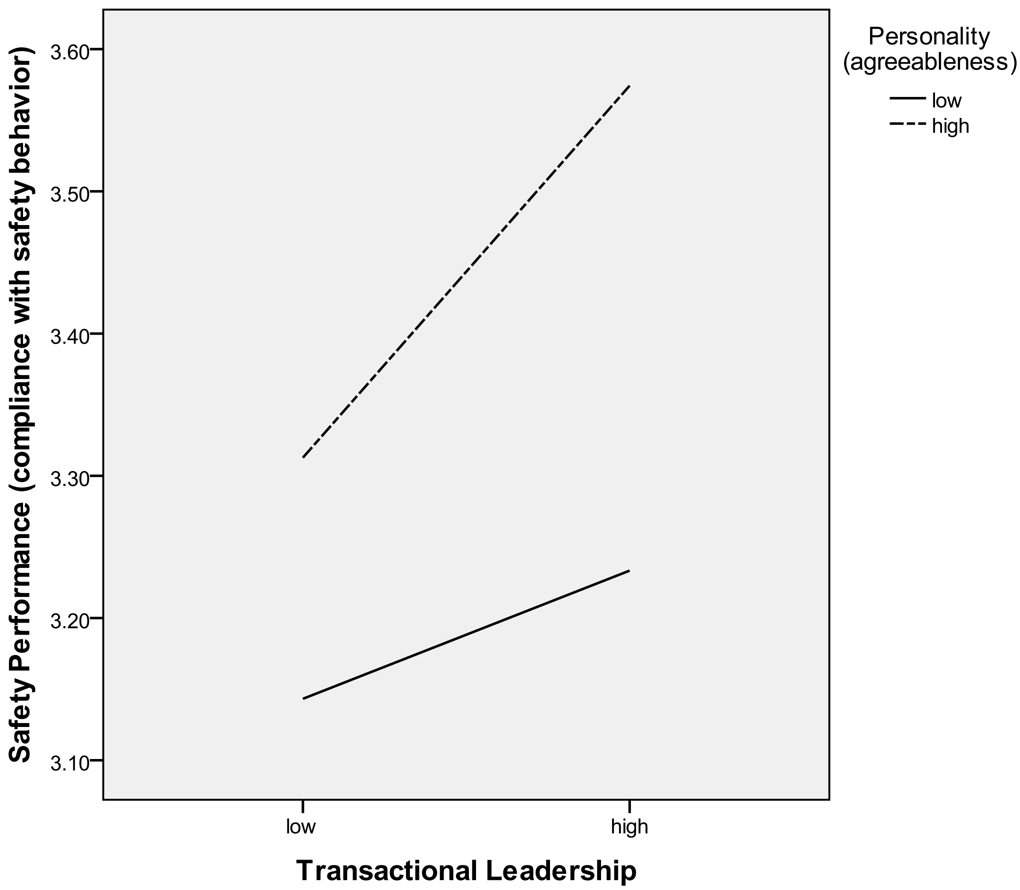

Figure 4.7
Plot of Interaction between Transactional Leadership and Agreeableness on Compliance with Safety Behavior

Table 4.18

Hierarchical Regression Analysis Using Emotional Stability as a Moderator in the Relationship between Management Practices, Leadership Styles and Compliance with Safety Behavior

Variables	**Step 1**	**Step 2**	**Step 3**
Model Variables			
Safety training	.084*	.084*	.103
Reward	.114**	.114**	-.015
Management commitment	.088*	.088*	.208
Communication and feedback	.133**	.133**	.493**
Hiring practices	.134**	.134**	-.060
Employee participation	.124**	.124**	-.066
Transformational leadership	.067	.067	.080
Transactional leadership	.133**	.133**	.064
Moderator Variable (emotional stability**)**		.001	-.059
Interaction Terms			
Emotional stability ×Safety training			-.028
Emotional stability × Reward			.188
Emotional stability × Management commitment			-.176
Emotional stability × Communication &feedback			-.519*
Emotional stability × Hiring practices			.254
Emotional stability × Employee participation			.294
Emotional stability × Transformational leadership			-.025
Emotional stability × Transactional leadership			.101
R^2	.147	.147	.161
Adjusted R^2	.138	.136	.141
R^2Change	.147	.000	.014
Sig. F Change	.000	.988	.175
Durbin Watson	1.511	1.511	1.511

* $p< 0.05$, ** $p < 0.01$

Table 4.18 shows the result of the regression analysis on the moderating effect of emotional stability on the relationship among management practices, leadership styles, and compliance with safety behavior. The table indicates that all independent variable dimensions had significant main effects on the dependent variable (compliance with safety behavior), except transformational leadership. The summary and the details (presented in Appendix G) of the results reflect the standardized coefficients (betas) for independent variables. The set of the independent variables at step 1 accounted for approximately 14.7% of the variance in compliance with safety behavior. The moderator variable at step 2 accounted for approximately 14.7% of the variance in compliance with safety behavior. Emotional stability as a moderator was not significantly related to compliance with safety behavior. At step 3, when the interaction terms were entered, a 1.4% increase in $R^2$was observed. Only one interaction term was significant, thus partially supporting hypothesis 3. The interaction terms were between emotional stability × communication and feedback (β = -0.519, t = -2.527, p = 0.012). While hypothesis 3bb was supported, hypotheses 3ax, 3az, 3ba, 3bc, 3bd, 4q, and 4r were rejected.

Table 4.18 also indicates that emotional stability significantly moderated the relationship between communication and feedback and compliance with safety behavior. Figure 4.8 shows that the relationship between communication and feedback and compliance with safety behavior is strongest among the individuals whom display high emotional stability and weakest among the individuals whom display low emotional stability. Individuals with either high or low emotional stability personality do not differ much in compliance with safety behavior under condition of high communication and feedback, but large differences were noted under conditions of low communication and feedback. In other word, under conditions of high communication and feedback, employees whom display low emotional stability have better compliance with safety behavior than those whom display high emotional stability personality.

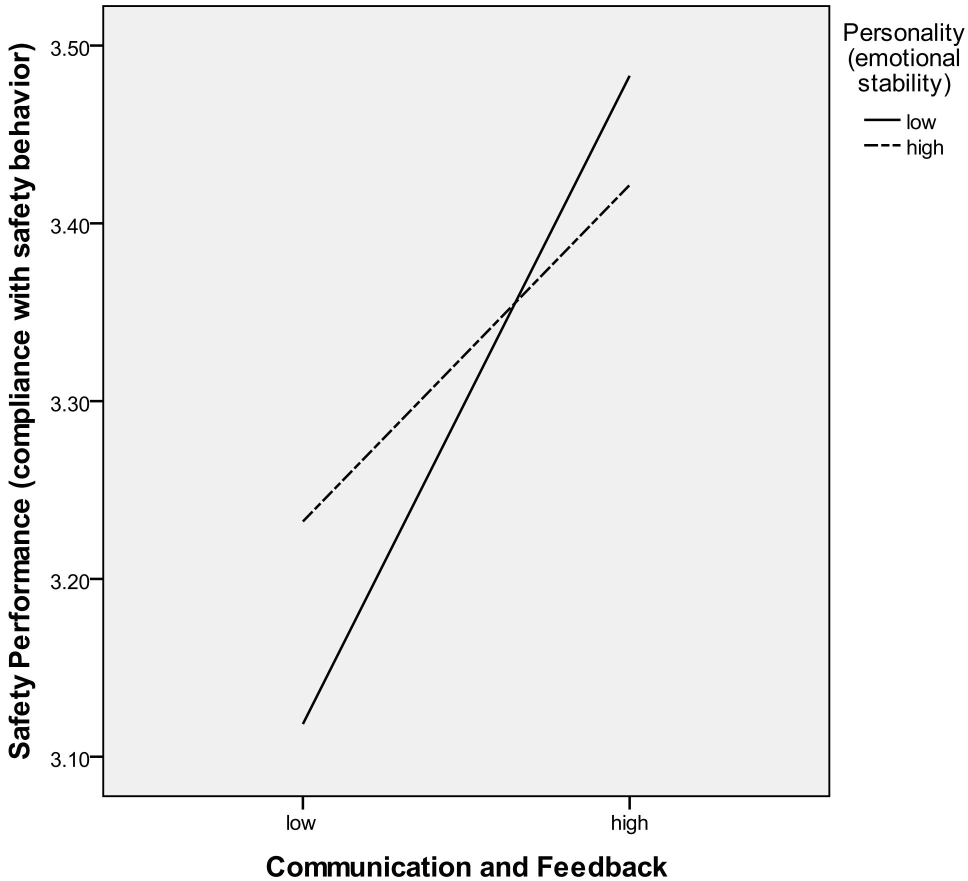

Figure 4.8
Plot of Interaction between Communication and Feedback and Emotional Stability on Complain with Safety Behavior

4.9.4 Interaction Effects of Personality Traits with Management Practices and Leadership Styles on Safety Participation

This section presents the results of the interaction effects among personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability), management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation), leadership styles (transformational and transactional leadership), and safety performance (safety participation).

Hypothesis 3 predicted that personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) moderate the relationship between management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation) and safety performance (safety participation). Hypothesis 4 predicted that personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) moderate the relationship between leadership styles (transformational and transactional leadership) and safety performance (safety participation).

Table 4.19 shows the result of the regression analysis on the moderating effect of extraversion on the relationship among management practices, leadership styles, and safety participation. The standardized coefficients (betas) of the independent variables (presented in Appendix G) are shown in the following steps: The set independent variables at step 1 accounted for approximately 17.4% of the variance in safety participation. All independent variable dimensions had significant main effects on the dependent variable (safety participation). The predictors in descending order were employee participation ($\beta = 0.156$, $t = 4.235$, $p = 0.00$), transactional leadership ($\beta = 0.155$, $t = 4.387$, $p = 0.00$), transformational leadership ($\beta = 0.129$, $t = 3.520$, $p = 0.00$), reward ($\beta = 0.124$, $t = 3.399$, $p = 0.01$), hiring practices ($\beta = 0.105$, $t = 3.021$, $p = 0.03$), communication and feedback (β = 0.93, t = 2.667, p = 0.08), safety training (β = 0.080, t = 2.303, p = 0.022), and management commitment (β = 0.080, t = 2.327, p = 0.020).

The relationship among all independent variable dimensions was positive. The moderator variable at step 2 accounted for approximately 17.8% of the variance in safety participation. Extraversion was not significantly related to safety participation. At step 3, when the interaction terms were entered, a 1.6% increase in R^2 was observed. Only two interactions were significant, thus partially supporting hypothesis 3. The interaction terms were between extraversion × employee participation (β = 0.522, t = 2.044, p = 0.041) and extraversion × safety training (β = -0.516, t = -2.345, p = 0.019). While hypotheses 3g and 3l were supported, hypotheses 3h, 3i, 3j, 3k, 4c, and 4d were rejected.

Table 4.19

Hierarchical Regression Analysis Using Extraversion as a Moderator in the Relationship between Management Practices, Leadership Styles and Safety Participation

Variables	Step 1	Step 2	Step 3
Model Variables			
Safety training	.080*	.080*	.515**
Reward	.124**	.120**	.113
Management commitment	.080*	.083*	.143
Communication and feedback	.093**	.089**	.301
Hiring practices	.105**	.108**	.006
Employee participation	.156**	.154**	-.233
Transformational leadership	.129**	.132**	-.084
Transactional leadership	.155**	.152**	.267
Moderator Variable (extraversion**)**		.062	.086
Interaction Terms			
Extraversion × Safety training			-.516*
Extraversion × Reward			.011
Extraversion × Management commitment			-.073
Extraversion × Communication and feedback			-.283
Extraversion × Hiring practices			.113
Extraversion × Employee participation			.522*
Extraversion × Transformational leadership			.282
Extraversion × Transactional leadership			-.172
R^2	.174	.178	.194
Adjusted R^2	.164	.167	.174
R^2Change	.174	.004	.016
Sig. F Change	.000	.070	.084
Durbin Watson	1.628	1.628	1.628

* $p< 0.05$, ** $p < 0.01$

As indicated in Table 4.19, extraversion significantly moderated the relationship between safety training and safety participation. Figure 4.9 shows that the relationship between safety training and safety participation is strongest among the individuals whom display high extraversion and weakest among the individuals whom display low extraversion. In both conditions of high and low safety training employees whom display high extraversion personality have better safety participation than those whom display low extraversion personality.

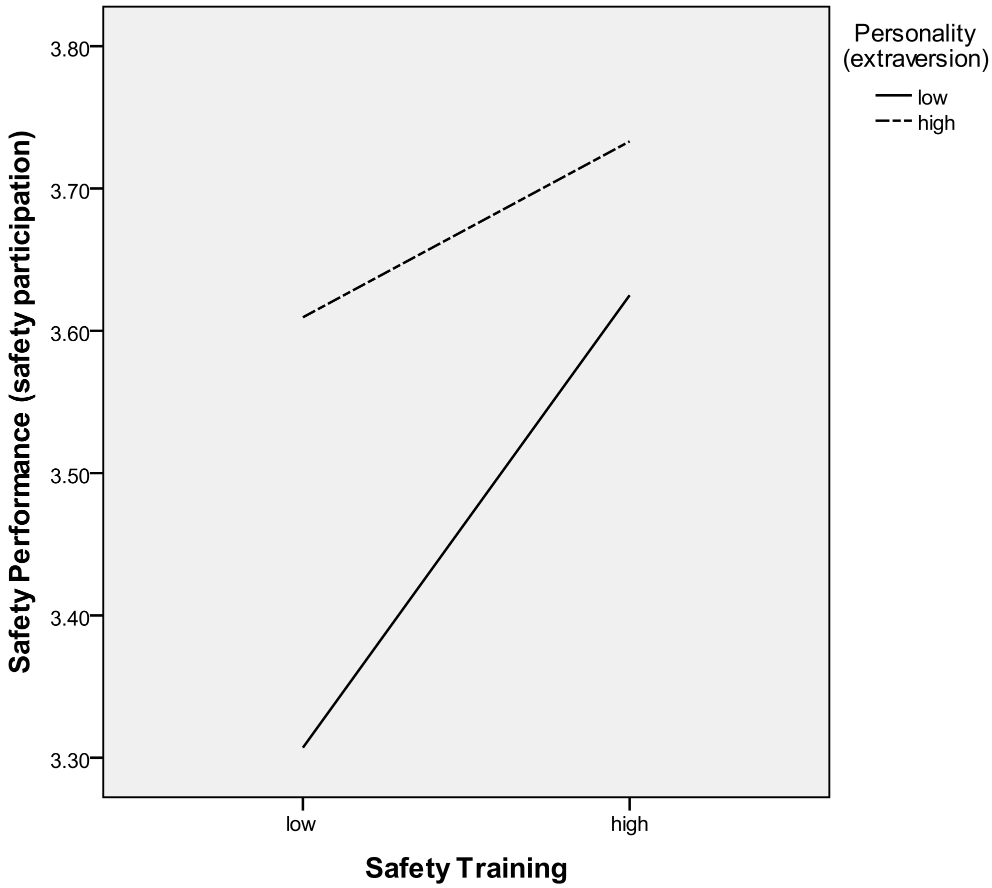

Figure 4.9
Plot of Interaction between Safety Training and Extraversion on Safety Participation

Table 4.19 shows that extraversion significantly moderated the relationship between employee participation and safety participation. Figure 4.10 shows that the relationship between employee participation and safety participation is strongest among the individuals whom display low extraversion and weakest among the individuals whom display high extraversion. Under conditions of low employee participation both employees whom display low and high extraversion personality did not differ much in safety participation. However, large differences were noted under conditions of high employee participation. In other words under conditions of high employee participation, employees whom display high extraversion personality have better employee participation than employees whom display low extraversion personality.

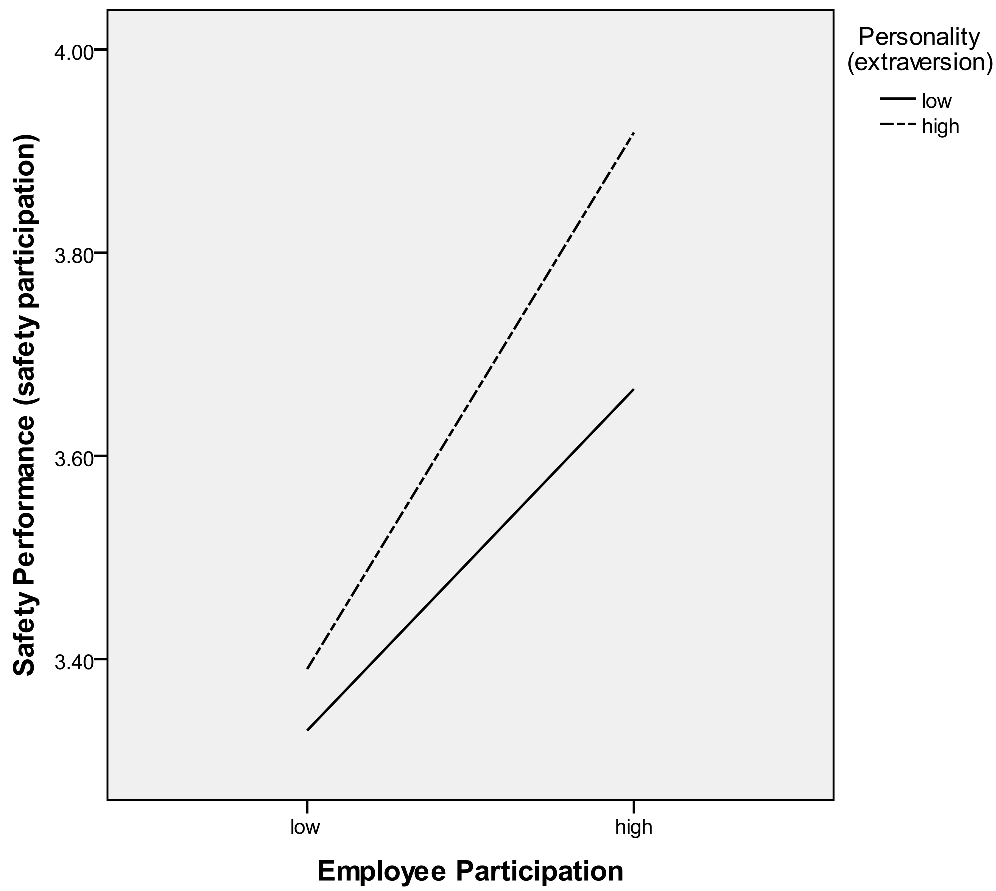

Figure 4.10
Plot of Interaction between Employee Participation and Extraversion on Safety Participation

Table 4.20 shows the result of hierarchical multiple regression analysis using conscientiousness as a moderator in the relationship between management practices and leadership styles (independent variables) and safety participation (dependent variable). The summary and the details of the results (presented in Appendix G) reflect that the standardized coefficients (betas) of the independent variables follow the following steps: The set of the independent variables at step 1 accounted for approximately 17.6% of the variance in compliance with safety behavior. All independent variable dimensions had significant main effects on safety participation. The moderator variable at step 2 accounted for approximately 18.5% of the variance in safety participation. Conscientiousness was significantly related to safety participation (β = 0.094, t = -2.707, p = 0.07). At step 3, when the interaction terms were entered, a 2.4% increase in R^2 was observed. Two interactions were significant, thus partially supporting hypothesis 3. The interaction terms were between conscientiousness × communication and feedback (β = -0.587, t = -2.822, p = 0.05) and conscientiousness × hiring practices (β = -0.376, t = -2.098, p = 0.036). While hypotheses 3v and 3w were supported, hypotheses 3s, 3t, 3u, 3x, 4g, and 4h were rejected.

Table 4.20 reveals that conscientiousness significantly moderated the relationship between communication and feedback and safety participation. Figure 4.11 shows that the relationship between communication and feedback and safety participation is strongest among the individuals whom display low conscientiousness and weakest among the individuals whom display high conscientiousness. Individuals whom display either high or low conscientiousness personality did not differ much in safety participation under condition of high communication and feedback, but large differences were noted under conditions of low communication and feedback. This indicates that under conditions of low communication and feedback, individuals whom display high conscientiousness personality have better safety participation than those whom display low conscientiousness low personality.

Table 4.20
Hierarchical Regression Analysis Using Conscientiousness as a Moderator in the Relationship between Management Practices, Leadership Styles and Safety Participation

Variables	**Step 1**	**Step 2**	**Step 3**
Model Variables			
Safety training	.080*	.079*	.025
Reward	.124**	.115**	.237
Management commitment	.082*	.083*	.200
Communication and feedback	.096**	.095**	.491**
Hiring practices	.108**	.111**	.404**
Employee participation	.154**	.146**	-.032
Transformational leadership	.127**	.118**	.029
Transactional leadership	.159**	.165**	.397**
Moderator Variable (conscientiousness)		.094**	.934**
Interaction Terms			
Conscientiousness ×Safety Training			.071
Conscientiousness × Reward			-.206
Conscientiousness × Management commitment			-.153
Conscientiousness × Communication and feedback			-.587**
Conscientiousness × Hiring practices			-.376*
Conscientiousness × Employee participation			.282
Conscientiousness × Transformational leadership			.128
Conscientiousness × Transactional leadership			-.352
R^2	.176	.185	.209
Adjusted R^2	.167	.174	.190
R^2Change	.176	.009	.024
Sig. F Change	.000	.007	.007
Durbin Watson	1.600	1.600	1.600

* p< 0.05, ** p < 0.01

Table 4.20 indicates that conscientiousness significantly moderated the relationship between hiring practices and safety participation. Figure 4.12 shows that the relationship between hiring practices and safety participation is strongest among the individuals whom display low conscientiousness and weakest among the individuals whom display high conscientiousness. Individuals whom display either low or high conscientiousness personality did not differ much in safety participation under condition of high hiring practices, but large differences were noted under conditions of low hiring practices. In other word, under conditions of low hiring practices, individuals whom display high conscientiousness personality have better safety participation than those whom display low conscientiousness personality.

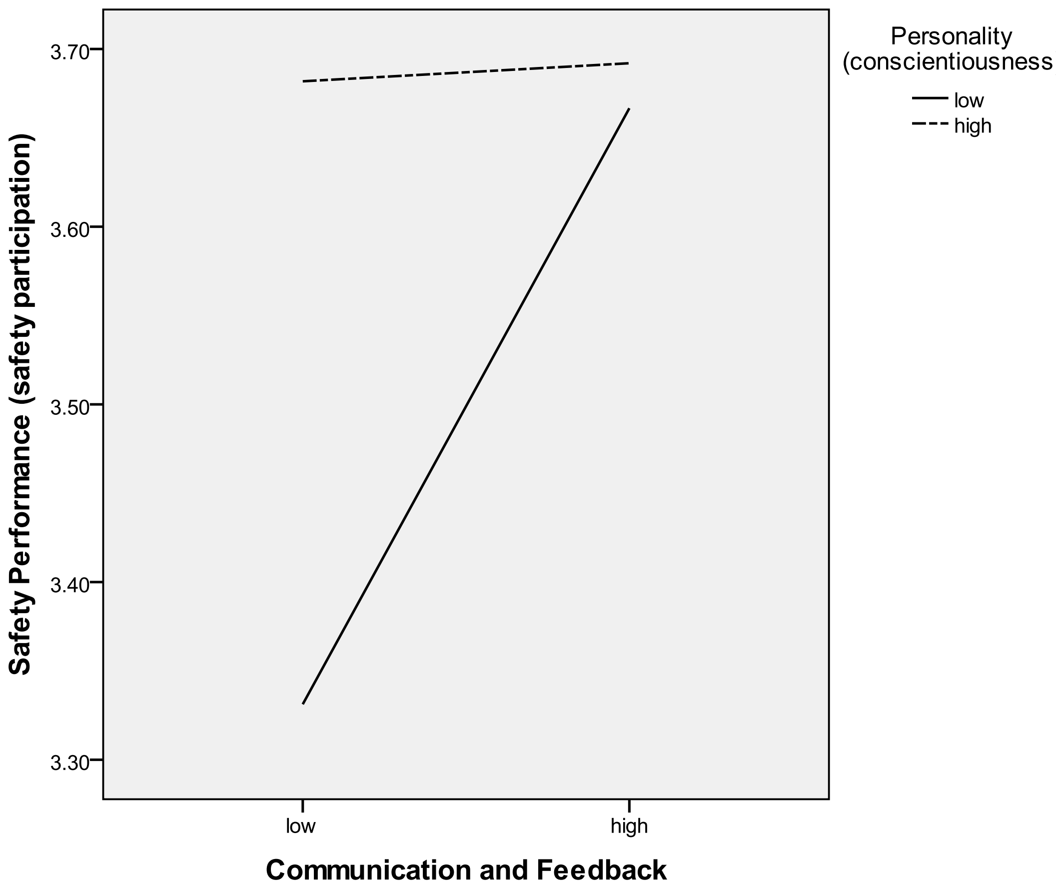

Figure 4.11
Plot of Interaction between Communication and Feedback and Conscientiousness on Safety Participation

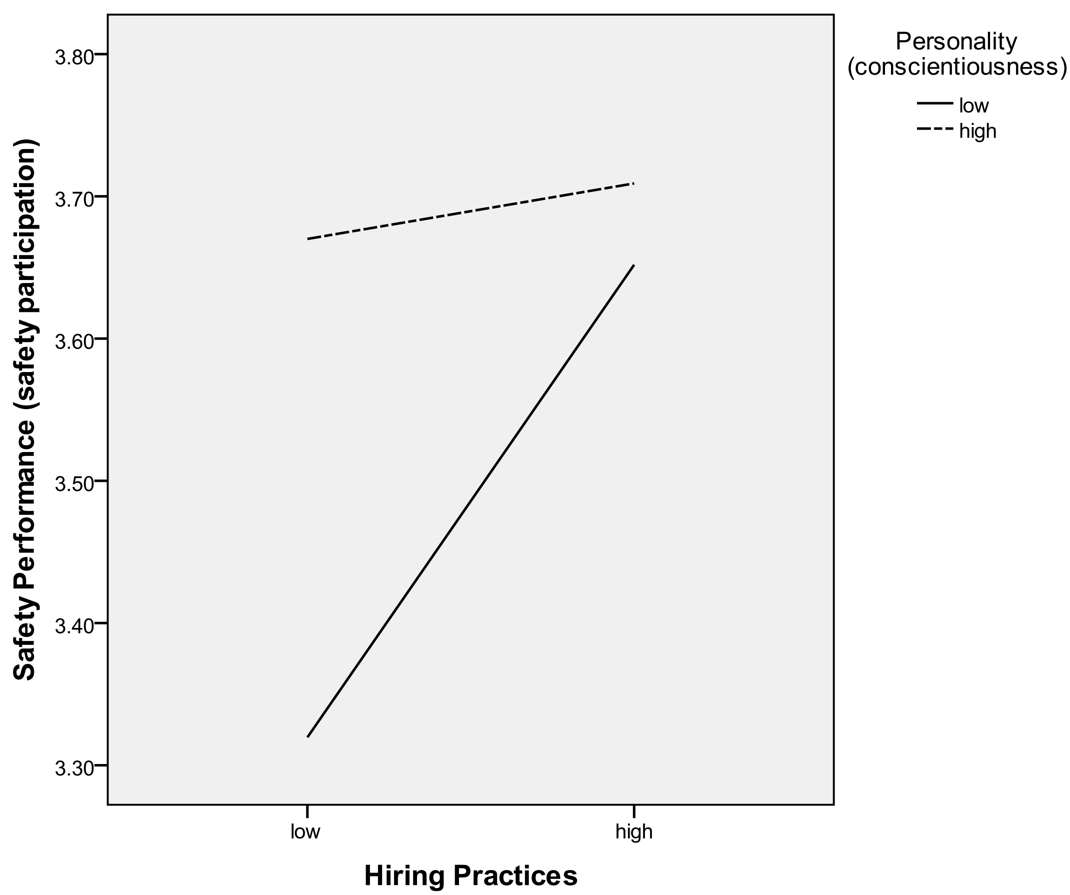

Figure 4.12
Plot of Interaction between Hiring Practices and Conscientiousness on Safety Participation

Table 4.21 displays the result of the hierarchical multiple regression analysis using intellect as a moderator of the relationship between management practices and leadership styles (independent variables) and safety participation (dependent variable). The summary and the details (presented in Appendix G) of the results reflect that the standardized coefficients (betas) of the independent variables are shown in the following steps: The set of the independent variables at step 1 accounted for approximately 17.4% of the variance in safety participation. All independent variable dimensions had significant main effects on the dependent variable (safety participation). The moderator variable at step 2 accounted for approximately 17.4% of the variance in safety participation. Intellect was not significantly related to safety participation. At step 3, when the interaction terms were entered, a 1.6% increase in R^2 was observed. Only one interaction term was significant, thus partially supporting hypothesis 3.The interaction terms were between intellect × communication and feedback ($\beta = -0.601$, $t = -3.019$, $p = 0.03$). While hypothesis 3ah was supported, hypotheses 3ae, 3af, 3ag, 3ai, 3aj, 4k, and 4l were rejected.

As indicated in Table 4.21, intellect significantly moderated the relationship between communication and feedback and safety participation. Figure 4.13 shows that the relationship between communication and feedback and safety participation is strongest among the individuals whom display low intellect personality and weakest among the individuals whom display high intellect personality. Individuals whom display high intellect personality have a better safety participation compared to those whom display low intellect personality under conditions of low communication and feedback. However, individuals whom display low intellect personality have a better safety participation compared to those whom display high intellect personality under conditions of high communication and feedback.

Table 4.21

Hierarchical Regression Analysis Using Intellect as a Moderator in the Relationship between Management Practices, Leadership Styles and Safety Participation

Variables	Step 1	Step 2	Step 3
Model Variables			
Safety training	.080*	.079*	.242
Reward	.124**	.124**	.250
Management commitment	.080*	.081*	.102
Communication and feedback	.093**	.092**	.483**
Hiring practices	.105**	.106**	.189
Employee participation	.156**	.157**	.158
Transformational leadership	.129**	.129**	.223
Transactional leadership	.155**	.155**	.050
Moderator Variable (intellect)		.018	.837**
Interaction Terms			
Intellect ×Safety training			-.221
Intellect × Reward			-.172
Intellect × Management commitment			-.037
Intellect × Communication and feedback			-.601**
Intellect × Hiring Practices			-.111
Intellect × Employee participation			-.017
Intellect × Transformational leadership			-.147
Intellect × Transactional leadership			.167
R^2	.174	.174	.190
Adjusted R^2	.164	.163	.170
R^2Change	.174	.000	.016
Sig. F Change	.000	.607	.098
Durbin Watson	1.578	1.578	1.578

* $p< 0.05$, ** $p < 0.01$

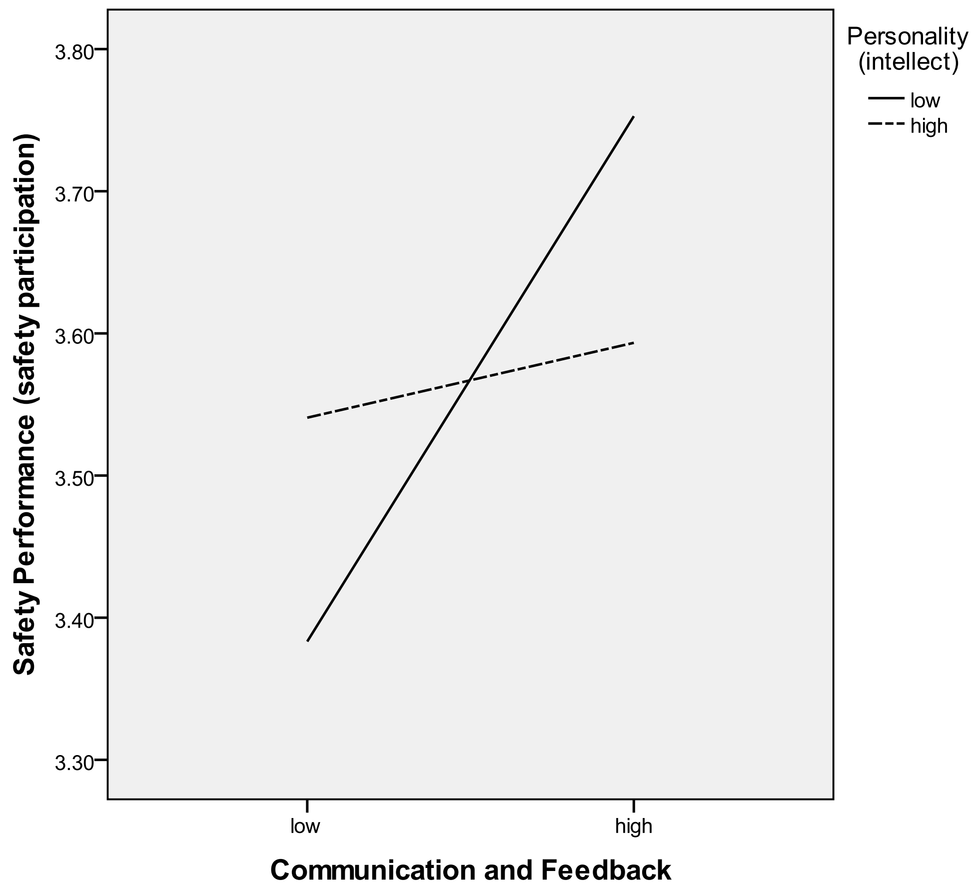

Figure 4.13
Plot of Interaction between Communication and Feedback and Intellect on Safety Participation

Table 4.22 displays the result of the regression analysis on the moderating effect of agreeableness on the relationship among management practices, leadership styles, and safety participation. The summary and the details of the results (presented in Appendix G) reflect that the standardized coefficients (betas) of the independent variables follow the following steps: The set of the independent variables at step 1 accounted for approximately 17.4% of the variance in safety participation. Table 4.22 also shows that all eight independent variable dimensions had significant main effects on the dependent variable. The moderator variable at step 2 accounted for approximately 18.2% of the variance in safety participation. Agreeableness was not significantly related to safety participation. At step 3, when the interaction terms were entered, a 3.7% increase in R^2 was observed. Four interaction terms were significant, thus partially supporting hypotheses 3 and 4. The interaction terms were between agreeableness × reward (β = -0.488, t = - 2.235, p = 0.026), management commitment (β = -0.349, t = -1.982, p = 0.048), communication and feedback (β = -0.492, t = -2.325, p = 0.020), and transformational leadership (β = -0.504, t = 2.490, p = 0.013). While hypotheses 3as, 3at, 3au, and 4o were supported, hypotheses 3ar, 3av, 3aw, and 4n were rejected.

Table 4.22

Hierarchical Regression Analysis Using Agreeableness as a Moderator in the Relationship between all Independent Variables and Safety Participation

Variables	**Step 1**	**Step 2**	**Step 3**
Model Variables			
Safety training	.080*	.073*	-.005
Reward	.124**	.114**	.407**
Management commitment	.080*	.072*	.303*
Communication and feedback	.093**	.087**	.399**
Hiring practices	.105**	.107**	.081
Employee participation	.156**	.151**	.378**
Transformational leadership	.129**	.126**	.419**
Transactional leadership	.155**	.148**	.036
Moderator Variable (agreeableness**)**		.093	1.425**
Interaction Terms			
Agreeableness ×Safety training			.111
Agreeableness × Reward			-.488*
Agreeableness × Management commitment			-.349*
Agreeableness × Communication and feedback			-.492*
Agreeableness × Hiring practices			.051
Agreeableness × Employee participation			-.392
Agreeableness × Transformational leadership			-.504*
Agreeableness × Transactional leadership			.198
R^2	.174	.182	.219
Adjusted R^2	.164	.171	.200
R^2Change	.174	.008	.037
Sig. F Change	.000	.008	.000
Durbin Watson	1.620	1.620	1.620

* $p< 0.05$, ** $p < 0.01$

Table 4.22 demonstrates that agreeableness significantly moderated the relationship between reward and safety participation. Figure 4.14 shows that the relationship between reward and safety participation is strongest among the individuals whom display high agreeableness and weakest among the individuals whom display low agreeableness. There were notable difference on safety participation level among individual whom display low and high agreeableness personality under condition of high reward, but large differences were noted under conditions of low reward. In both conditions individuals with high agreeableness personality have better safety participation level compared to those who display low agreeableness personality.

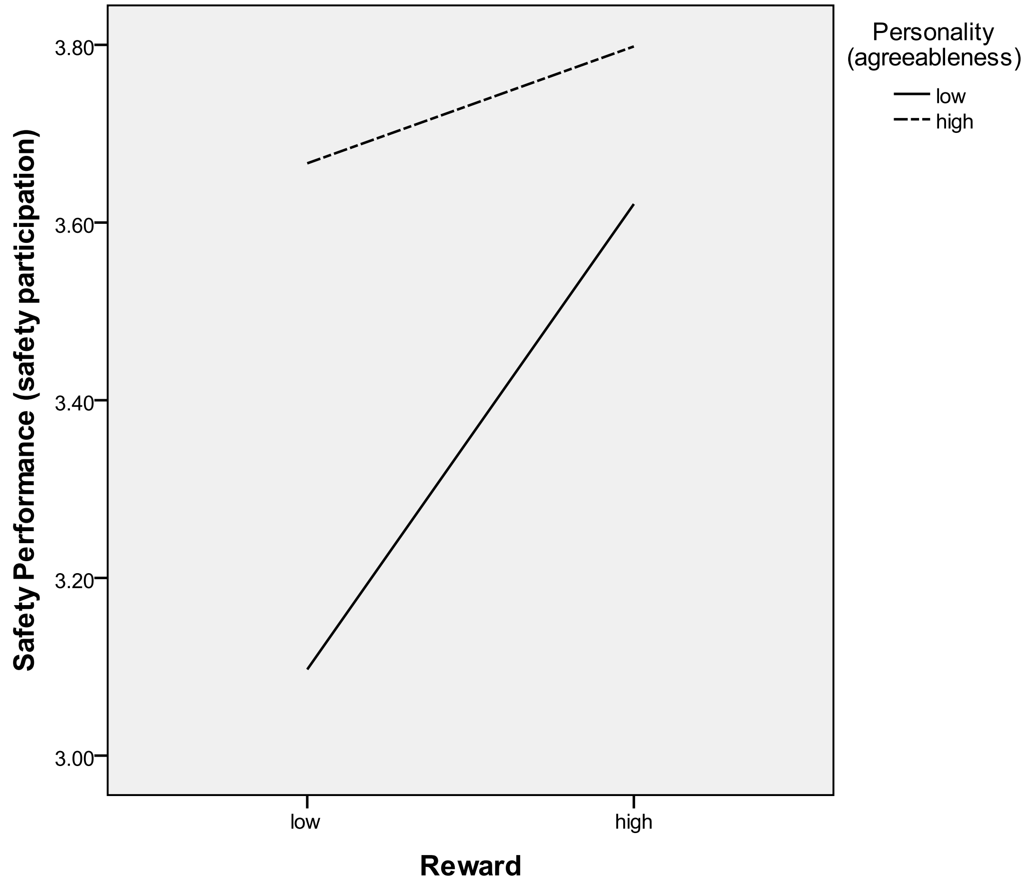

Figure 4.14
Plot of Interaction between Reward and Agreeableness on Safety Participation

Table 4.22 also indicated that agreeableness significantly moderated the relationship between management commitment and safety participation. Figure 4.15 shows that the relationship between management commitment and safety participation is strongest among the individuals whom display high agreeableness and weakest among the individuals whom display low agreeableness. Under both condition of low and high management commitment employees who display high agreeableness personality have better safety participation compared to employees who display low agreeableness personality.

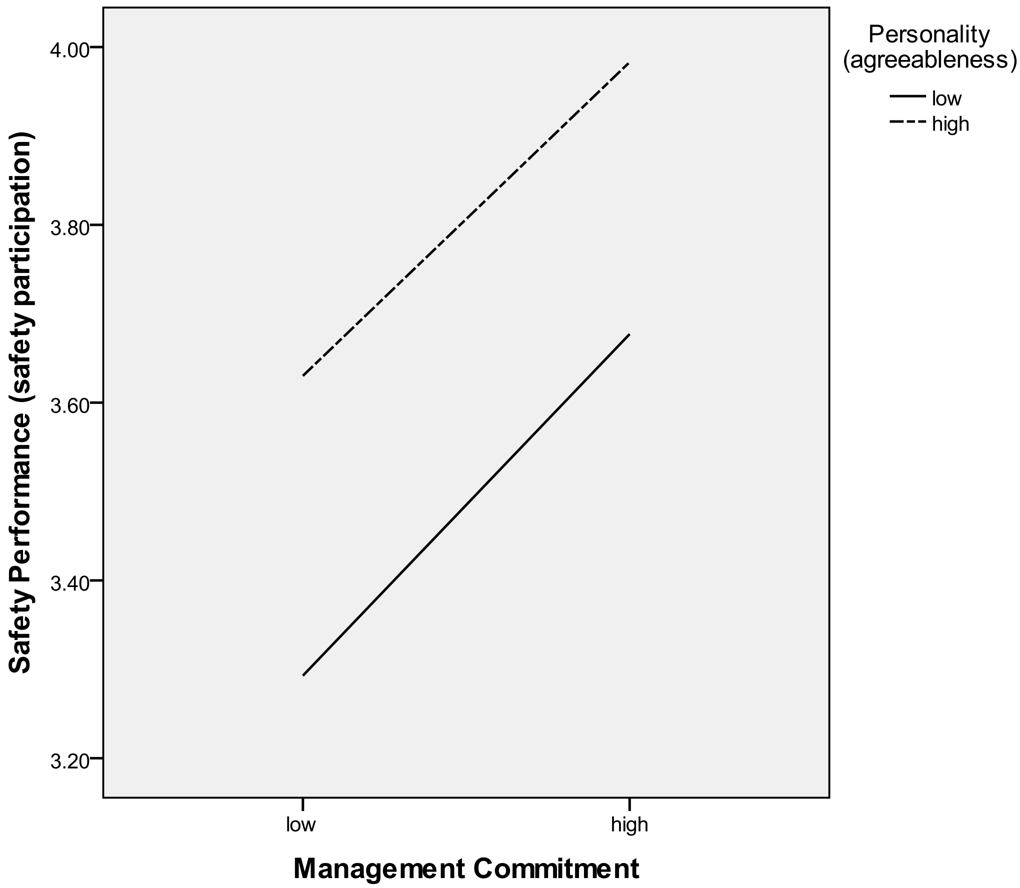

Figure 4.15
Plot of Interaction between Management Commitment and Agreeableness on Safety Participation

Agreeableness likewise significantly moderated the relationship between communication and feedback and safety participation (Table 4.22). Figure 4.16 shows that the relationship between communication and feedback and safety participation is strongest among the individuals whom display low agreeableness and weakest among the individuals whom display high agreeableness. In both conditions of low and high communication and feedback, employees who display high agreeableness have better safety participation than employees whom display low personality.

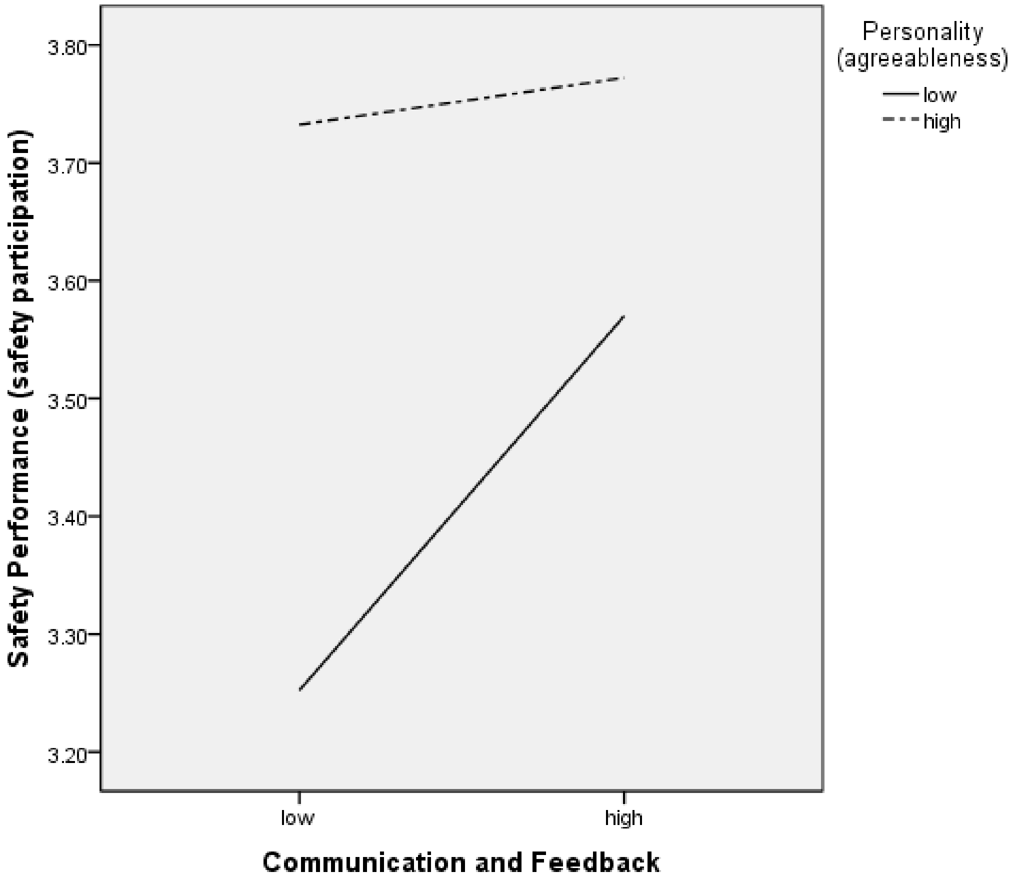

Figure 4.16
Plot of Interaction between Communication and Feedback and Agreeableness on Safety Participation

Similarly indicated in Table 4.22 is that agreeableness significantly moderated the relationship between transformational leadership and safety participation. Figure 4.17 shows that the relationship between transformational leadership and safety participation is strongest among the individuals whom display low agreeableness and weakest among the individuals whom display high agreeableness. In conditions of high transformational leadership there is not much difference in safety participation between employees whom display low and high agreeableness personality. However, under condition of low transformational leadership, large differences were noted. In other word, under conditions of low transformational leadership, employees displaying high agreeableness personality have better safety participation than those employees displaying low agreeableness personality.

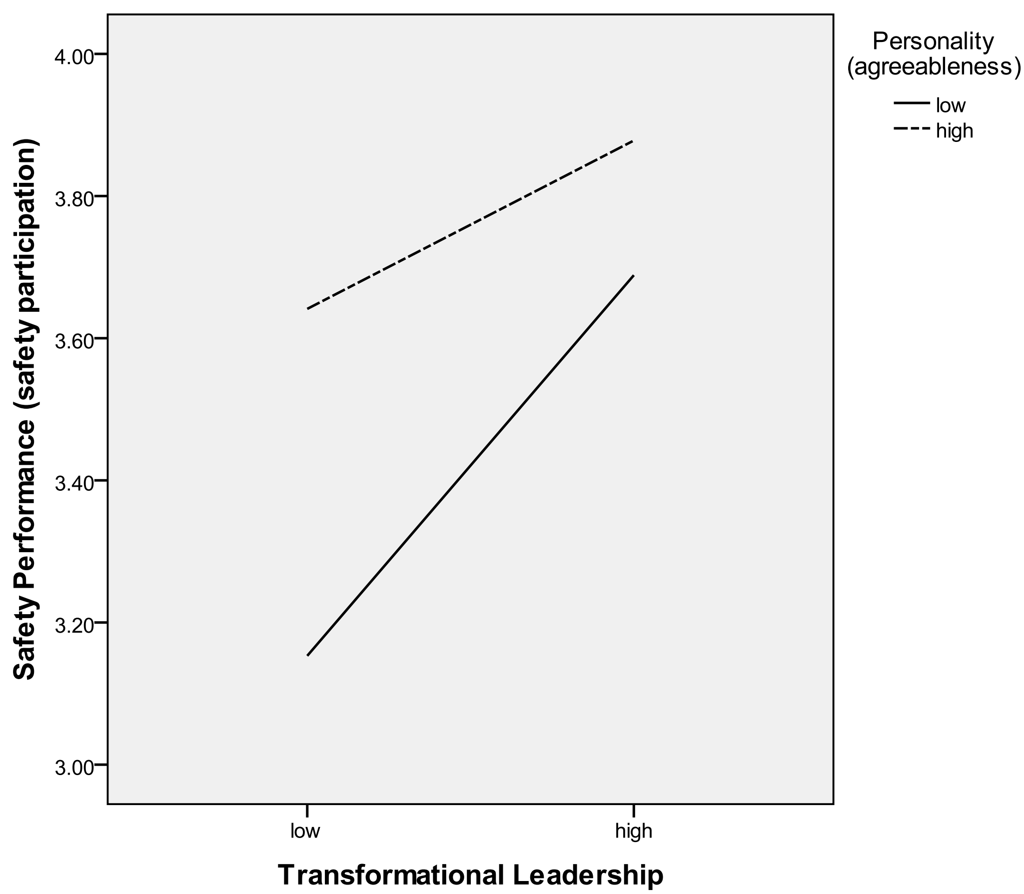

Figure 4.17
Plot of Interaction between Transformational Leadership and Agreeableness on Safety Participation

Table 4.23 presents the result of the hierarchical multiple regression analysis using emotional stability as a moderator in the relationship among management practices, leadership styles, and safety participation. The summary and the details of the results (presented in Appendix G) reflect that the standardized coefficients (betas) of the independent variables follow the following steps: The set of the independent variables at step 1 accounted for approximately 17.4% of the variance in safety participation. Table 4.23 also shows that all eight independent variable dimensions had significant main effects on safety participation. The moderator variable at step 2 accounted for approximately 18.6% of the variance in safety participation. Emotional stability was significantly related to safety participation (β = -0.111, t = 3.252, p = 0.01). At step 3, when the interaction terms were entered, a 1.3% increase in R^2 was observed. Only one interaction term was significant, thus partially supporting hypothesis 3. The interaction terms were between emotional stability × hiring practices (β = -0.451, t = -2.449, p = 0.015). While hypothesis 3bi was supported, hypotheses 3be, 3bf, 3bg, 3bh, 3bj, 4s, and 4t were rejected.

Table 4.23

Hierarchical Regression Analysis Using Emotional Stability as a Moderator in the Relationship between all Independent Variables and Safety Participation

Variables	**Step 1**	**Step 2**	**Step 3**
Model Variables			
Safety training	.080*	.077*	.039
Reward	.124**	.119**	.132
Management commitment	.080*	.079*	-.180*
Communication and feedback	.093**	.089*	.053
Hiring practices	.105**	.112**	.453
Employee participation	.156**	.156**	.150
Transformational leadership	.129**	.126**	.242
Transactional leadership	.155**	.156**	.205
Moderator Variable (emotional stability)		-.111**	.062
Interaction Terms			
Emotional Stability ×Safety training			.051
Emotional Stability × Reward			-.026
Emotional Stability ×Management commitment			.346
Emotional Stability × Communication & feedback			.050
Emotional Stability × Hiring practices			-.451**
Emotional Stability × Employee participation			.002
Emotional Stability × Transformational leadership			-.168
Emotional Stability × Transactional leadership			-.076
R^2	.174	.186	.199
Adjusted R^2	.164	.176	.179
R^2 Change	.174	.012	.013
Sig. F Change	.000	.001	.207
Durbin Watson	1.601	1.601	1.601

* $p < 0.05$, ** $p < 0.01$

Also demonstrated in Table 4.23 is that emotional stability significantly moderated the relationship between hiring practices and safety participation. Figure 4.18 shows that the relationship between hiring practices and safety participation is strongest among the individuals whom display high emotional stability and weakest among the individuals whom display low emotional stability. In both condition of low and high hiring practices employees whom display low emotional stability personality have better safety participation than those employees whom display high emotional stability personality.

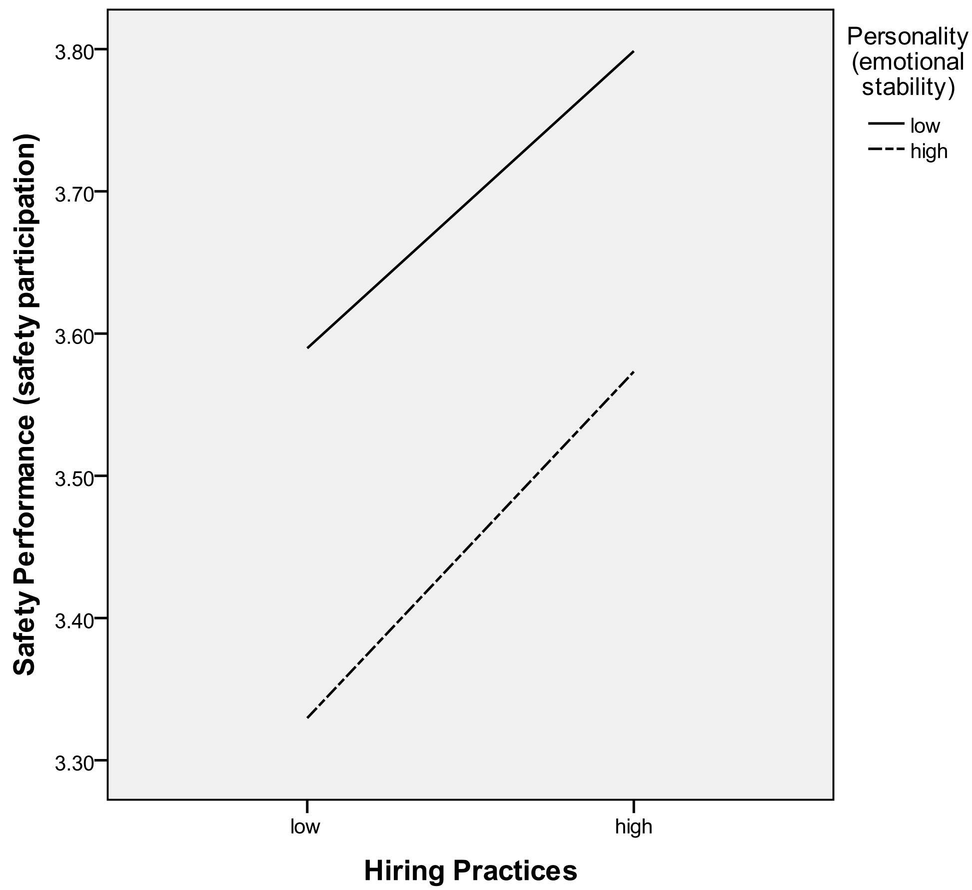

Figure 4.18
Plot of Interaction between Hiring Practices and Emotional Stability on Safety Participation

Table 4.24 summarizes the results of the hypotheses tested in this study.

Table 4.24
Summary of Hypotheses Testing

	Hypotheses Statement	Results
H1:	**Management practices are positively to safety performance.**	
H1a:	Safety training is positively related to compliance with safety behavior.	Supported
H1b:	Reward is positively related to compliance with safety behavior.	Supported
H1c:	Management commitment is positively related to compliance with safety behavior.	Supported
H1d:	Communication and feedback is positively related to compliance with safety behavior.	Supported
H1e:	Hiring practices are positively related to compliance with safety behavior.	Supported
H1f:	Employee participation is positively related to compliance with safety behavior.	Supported
H1g:	Safety training is positively related to safety participation.	Supported
H1h:	Reward is positively related to safety participation.	Supported
H1i:	Management commitment is positively related to safety participation.	Supported
H1j:	Communication and feedback is positively related to safety participation.	Supported
H1k:	Hiring practices are positively related to safety participation.	Supported
H1l:	Employee participation is positively related to safety participation.	Supported
H2:	**Leadership styles are positively to safety performance.**	
H2a:	Transformational leadership is positively related to compliance with safety behavior.	Rejected
H2b:	Transactional leadership is positively related to compliance with safety behavior.	Supported
H2c:	Transformational leadership is positively related to safety participation.	Supported
H2d:	Transactional leadership is positively related to safety participation	Supported
H3:	**Personality moderates the relationship between management practices and safety performance.**	
H3a:	Extraversion moderates the relationship between safety training and compliance with safety behavior.	Rejected
H3b:	Extraversion moderates the relationship between reward and compliance with safety behavior.	Rejected
H3c:	Extraversion moderates the relationship between management commitment and compliance with safety behavior.	Supported
H3d:	Extraversion moderates the relationship between communication and feedback and compliance with safety behavior.	Rejected
H3e:	Extraversion moderates the relationship between hiring practices and compliance with safety behavior.	Supported
H3f:	Extraversion moderates the relationship between employee participation and compliance with safety behavior.	Rejected
H3g:	Extraversion moderates the relationship between safety training and safety participation	Supported
H3h:	Extraversion moderates the relationship between reward and safety participation.	Rejected
H3i:	Extraversion moderates the relationship between management commitment and safety participation.	Rejected
H3j:	Extraversion moderates the relationship between communication and feedback and safety participation.	Rejected
H3k:	Extraversion moderates the relationship between hiring practices and safety participation.	Rejected
H3l:	Extraversion moderates the relationship between employee participation and safety participation	Supported
H3m:	Conscientiousness moderates the relationship between safety training and compliance with safety behavior.	Rejected

Table 4.24 (Continued)

	Hypotheses Statement	Results
H3n:	Conscientiousness moderates the relationship between reward and compliance with safety behavior.	Rejected
H3o:	Conscientiousness moderates the relationship between management commitment and compliance with safety behavior.	Rejected
H3p:	Conscientiousness moderates the relationship between communication and feedback and compliance with safety behavior.	Supported
H3q:	Conscientiousness moderates the relationship between hiring practices and compliance with safety behavior.	Rejected
H3r:	Conscientiousness moderates the relationship between employee participation and compliance with safety behavior.	Rejected
H3s:	Conscientiousness moderates the relationship between safety training and safety participation.	Rejected
H3t:	Conscientiousness moderates the relationship between reward and safety participation.	Rejected
H3u:	Conscientiousness moderates the relationship between management commitment and safety participation.	Rejected
H3v:	Conscientiousness moderates the relationship between communication and feedback and safety participation.	Supported
H3w:	Conscientiousness moderates the relationship between hiring practices and safety participation.	Supported
H3x:	Conscientiousness moderates the relationship between employee participation and safety participation.	Rejected
H3y:	Intellect moderates the relationship between safety training and compliance with safety behavior.	Rejected
H3z:	Intellect moderates the relationship between reward and compliance with safety behavior.	Rejected
H3aa:	Intellect moderates the relationship between management commitment and compliance with safety behavior.	Rejected
H3ab:	Intellect moderates the relationship between communication and feedback and compliance with safety behavior.	Supported
H3ac:	Intellect moderates the relationship between hiring practices and compliance with safety behavior.	Rejected
H3ad:	Intellect moderates the relationship between employee participation and compliance with safety behavior.	Rejected
H3ae:	Intellect moderates the relationship between safety training and safety participation.	Rejected
H3af:	Intellect moderates the relationship between reward and safety participation.	Rejected
H3ag:	Intellect moderates the relationship between management commitment and safety participation.	Rejected
H3ah:	Intellect moderates the relationship between communication and feedback and safety participation.	Supported
H3ai:	Intellect moderates the relationship between hiring practices and safety participation.	Rejected
H3aj:	Intellect moderates the relationship between employee participation and safety participation.	Rejected
H3ak:	Agreeableness moderates the relationship between safety training and compliance with safety behavior.	Rejected
H3al:	Agreeableness moderates the relationship between reward and compliance with safety behavior.	Supported
H3am:	Agreeableness moderates the relationship between management commitment and compliance with safety behavior.	Rejected
H3an:	Agreeableness moderates the relationship between communication and feedback and compliance with safety behavior.	Rejected
H3ap:	Agreeableness moderates the relationship between hiring practices and compliance with safety behavior.	Rejected

Table 4.24 (Continued)

	Hypotheses Statement	Results
H3aq:	Agreeableness moderates the relationship between employee participation and compliance with safety behavior.	Rejected
H3ar:	Agreeableness moderates the relationship between safety training and safety participation.	Rejected
H3as:	Agreeableness moderates the relationship between reward and safety participation.	Supported
H3at:	Agreeableness moderates the relationship between management commitments and safety participation.	Supported
H3au:	Agreeableness moderates the relationship between communication and feedback and safety participation.	Supported
H3av:	Agreeableness moderates the relationship between hiring practices and safety participation.	Rejected
H3aw:	Agreeableness moderates the relationship between employee participation and safety participation.	Rejected
H3ax:	Emotional stability moderates the relationship between safety training and compliance with safety behavior.	Rejected
H3az:	Emotional stability moderates the relationship between reward and compliance with safety behavior.	Rejected
H3ba:	Emotional stability moderates the relationship between management commitment and compliance with safety behavior.	Rejected
H3bb:	Emotional stability moderates the relationship between communication and feedback and compliance with safety behavior.	Supported
H3bc:	Emotional stability moderates the relationship between hiring practices and compliance with safety behavior.	Rejected
H3bd:	Emotional stability moderates the relationship between employee participation and compliance with safety behavior.	Rejected
H3be:	Emotional stability moderates the relationship between safety training and safety participation.	Rejected
H3bf:	Emotional stability moderates the relationship between reward and safety participation.	Rejected
H3bg:	Emotional stability moderates the relationship between management commitments and safety participation.	Rejected
H3bh:	Emotional stability moderates the relationship between communication and feedback and safety participation.	Rejected
H3bi:	Emotional stability moderates the relationship between hiring practices and safety participation.	Supported
H3bj:	Emotional stability moderates the relationship between employee participation and safety participation.	Rejected
H4:	**Personality moderates the relationship between leadership styles and safety performance.**	
H4a:	Extraversion moderates the relationship between transformational leadership and compliance with safety behavior.	Rejected
H4b:	Extraversion moderates the relationship between transactional leadership and compliance with safety behavior.	Rejected
H4c:	Extraversion moderates the relationship between transformational leadership and safety participation.	Rejected
H4d:	Extraversion moderates the relationship between transactional leadership and safety participation.	Rejected
H4e	Conscientiousness moderates the relationship between transformational leadership and compliance with safety behavior.	Rejected
H4f:	Conscientiousness moderates the relationship between transactional leadership and compliance with safety behavior.	Rejected

Table 4.24 (Continued)

	Hypotheses Statement	Results
H4g:	Conscientiousness moderates the relationship between transformational leadership and safety participation.	Rejected
H4h:	Conscientiousness moderates the relationship between transactional leadership and safety participation	Rejected
H4i:	Intellect moderates the relationship between transformational leadership and compliance with safety behavior.	Rejected
H4j:	Intellect moderates the relationship between transactional leadership and compliance with safety behavior.	Supported
H4k	Intellect moderates the relationship between transformational leadership and safety participation.	Rejected
H4l:	Intellect moderates the relationship between transactional leadership and safety participation.	Rejected
H4m:	Agreeableness moderates the relationship between transformational leadership and compliance with safety behavior.	Rejected
H4n:	Agreeableness moderates the relationship between transactional leadership and compliance with safety behavior.	Supported
H4o	Agreeableness moderates the relationship between transformational leadership and safety participation.	Supported
H4p:	Agreeableness moderates the relationship between transactional leadership and safety participation.	Rejected
H4q:	Emotional Stability moderates the relationship transformational leadership and compliance with safety behavior.	Rejected
H4r:	Emotional Stability moderates the relationship transactional leadership and compliance with safety behavior.	Rejected
H4s:	Emotional Stability moderates the relationship transformational leadership and safety participation.	Rejected
H4t:	Emotional Stability moderates the relationship transactional leadership and safety participation.	Rejected

4.10 SUMMARY

Aside from providing data on the general characteristics of the sample, as well as the descriptive statistics of the main variables involved in the study, this chapter has presented the empirical results of the conducted tests on the hypotheses of the study. Data were gathered using a self-administered questionnaire survey. Management practices and leadership styles were generally found to be positively associated with safety performance. Multiple regression analysis provided full support for the relationship between management practices and safety performance (first hypothesis) and partial support for the relationship between leadership styles and safety performance (second hypothesis). Finally, hierarchical regression analysis was performed to determine the moderating effect of personality traits on safety performance (third and fourth hypotheses). The results of the study provided partial support for these moderating effects. The final chapter will discuss the findings, followed by managerial and theoretical implications, suggestions for future research, statement of limitations, and the conclusion of this study.

CHAPTER FIVE

DISCUSSIONS, IMPLICATIONS AND CONCLUSIONS

5.1 INTRODUCTION

In the previous chapter, the results of this study have been presented. Out of the four research hypotheses formulated for the study, one is fully supported, whereas the others are partially supported. This chapter attempts to discuss the results in the context of safety performance, and is thus organized as follows: The study, as well as discussions on the research questions and hypotheses, will be reviewed. Implications of the research on theory and practice, along with suggestions for future studies, will be then be presented. The limitations of the study will subsequently be highlighted, followed by concluding remarks.

5.2 DISCUSSION

This study mainly aims to identify the level of safety performance in the O&G industry in Iraq. Specifically, this study examines the direct relationship of management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation) and leadership styles (transformational and transactional leadership) with safety performance (compliance with safety behavior, and safety participation). Toward this end, a number of research hypotheses have been formulated based on the research questions. This study has generally succeeded in establishing the determinants of safety performance. Following are discussions on each research question. Specifically, the first part discusses the level of safety performance in the O&G industry in Iraq, and the second part discusses the direct effect of the independent variables (management practices, and leadership styles) on the dependent variable (safety performance). Finally, the moderating effect of personality traits on the relationship of management practices and leadership styles with safety performance is discussed.

5.2.1 Safety Performance

The first research question assesses the level of safety performance in the O&G industry in Iraq, which was measured by examining the mean value of both dimensions of safety performance measures (compliance with safety behavior, and safety participation). The term safety compliance refers to the core behavior workers need to perform to maintain workplace safety. Such behavior includes maintaining the standard of work procedures and wearing personal protective equipment (Neal & Griffin, 2006). Additionally, safety compliance deals with the efforts employees exert to maintain workplace safety by following the organizational safety based procedures, rules, and regulations (Griffin & Neal, 2000). Schutte (2010) refers safety compliance to behavior focusing on meeting the minimum work safety standards, such as following safety procedures at the workplace. On the other hand, safety participation refers to behavior that indirectly contributes to a worker's personal safety and encourages the development of an environment that supports safety. This behavior includes such activities as participating in voluntary safety activities, helping co-workers with safety-related issues, and attending safety meetings (Broadbent, 2004; Neal & Griffin, 2006; Lu & Yang, 2010).

Based on the collected data, the mean and standard deviation of safety participation (3.56 and .809, respectively) were relatively higher than those of compliance with safety behavior (3.30 and .807, respectively). These findings suggest that the level of safety performance in the O&G industry was moderate but it was quite low compared to the studies conducted in the manufacturing industry in North Iraq. For example, Al-Yusuf, (2009) conducted a study to examine the effect of safety culture on safety performance in the manufacturing industry (petrochemical industry and chemical fertilizer industry) in North Iraq. He found the mean of compliance with safety behavior of 4.55 with a standard deviation of .60 and safety participation of 4.20, with a standard deviation of .68.Additionally, according to the report by the Iraqi Ministry of Manufacturing (2010), the level of safety performance in (petrochemical industry, chemical fertilizer industry and iron and steel industry) was excellent in terms of applying the requirements of occupational safety and reduction of occupational accidents (Refer Table 1.1).

When compared with previous studies that considered safety performance (compliance with safety behavior and safety participation), the level of safety performance in O&G in Iraq was also low. For example, Lu and Yang (2010) conducted a study to examine safety leadership and safety behavior in container terminal operations in Taiwan. This study found the mean for safety participation was 4.08 with a standard deviation of .59, and the mean for compliance with safety behavior was 4.29 with a standard deviation of .48. Additionally, Neal and Griffin (2006) found that the means of compliance with safety behavior and safety participation are 4.48 and 3.93, respectively, with a standard deviation of .63 and .89, respectively, in their study of examine the relationships among safety climate, safety motivation and safety behavior in USA. Furthermore, Vinodkumar and Bhasi (2010), in their study of safety management practices and safety performance in Kerala, India, found that the mean for safety participation was 3.80 with a standard deviation of .61, and the mean for compliance with safety behavior was 3.88 with a standard deviation of .70. Tharaldsen *et al.* (2010) conducted a study to examine the impact of group membership, work factors and trust on safety performance in UK and Norwegian. The study found the means of compliance with safety behavior and safety participation are 4.73 and 4.08 respectively, with a standard deviation of 0.55 and 0.87 respectively. As the above studies employed the same instrument in measuring safety performance, this makes the comparison more valid and meaningful.

There are several possibilities for the above findings; firstly Iraq is a country that is recovering from war (Allawi, 2007; Belasco, 2011; Hinnebusch, 2007). The oil and gas sector was being the worst sector affected from the war (Cordesman, Alsis, Mausner, & Loi, 2011; Ebel, 2010; Hinnebusch, 2006). As the government was more focused in restoring its operation back to normal, very minimal attention was naturally given to occupational safety. Secondly, from the employee's perspective, getting back or securing a job would be a priority than focusing on safety at work (Al-Moumen, 2009; Blanchard, 2007). While these processes take place the emphasis on occupational safety would take a back seat. The safety issue will be given priority only when the restoration process by the government, employer, and employee is over. Thirdly, Al-Yusuf (2009) conducted a study in the North Iraq, which was not affected by the war (Behn, 2007;

Christoff, 2008) as compared to the current study which was conducted at Basrah. This study location would be another plausible explanation to such findings. Basrah is unique as it is located in South of Iraq and is recognized as being the largest producer of oil and gas in Iraq (Jaffe, 2006; Visser, 2007), and contains the largest storage of oil and gas in the world (Blanchard, 2009, Kumins, 2005). In addition, the city was badly affected by the war (Ebel, 2010; Kumins, 2005) and most oil and gas facilities in the city was destroyed in the war (Fawn & Hinnebusch, 2006). This could further support that occupational safety is only given priority in a non-crisis environment. Therefore, it is not surprising for the conflicting findings in the same country.

5.2.2 Main Effect of the Relationship between Management Practices and Leadership Styles on Safety Performance

Following the second and third research questions, management practices are hypothesized to have a positive effect on safety performance [H1]. The same was assumed for leadership styles [H2]. The results presented in Tables 4.12 and 4.13 in the previous chapter fully supported the hypotheses on management practices and partially supported the hypotheses on leadership styles in relation to safety performance. The following sections explain the relationship of each variable examined in this study.

5.2.2.1 Management Practices

In this study, management practices serve as one of the independent variables. As mentioned earlier, management practices generally refer to methods or techniques most effective for achieving organizational goals through the optimum utilization of organizational resources (Dorji & Hadikusumo, 2006). In this work, management practices refer to actual practices, roles, and functions associated with organizational safety and employees (Kirwan, 1998). Management practices not only improve working conditions, but also positively affect employee attitudes and behavior in terms of safety, thereby reducing workplace accidents (Vinodkumar & Bhasi, 2010). Accordingly, within the safety performance context, the application of management practices can improve performance in terms of safety and accident prevention, which are otherwise characterized by high risk and serious cases involving life-threatening situations (Dorji & Hadikusumo, 2006; Skjerve, 2008). The present study used six dimensions of management practices, including safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation. The following subsection discusses the results of each management practice dimension outlined.

5.2.2.1.1 Safety Training

The present study hypothesized that safety training positively relates to safety performance (compliance with safety behavior, and safety participation) [H1a and H1g]. The hypotheses have received empirical support. The present study found that employees with higher safety training demonstrated safety performance better than those with lower safety training. The need for safety training of employees to prevent occupational accidents and injuries is highlighted primarily because safety training helps reduce hazards and improves employee capability of to tackle occupational accidents through acquisition of knowledge, skills, and competencies from vocational or practical teaching (Arboleda at el., 2003). Additionally, training programs engage employees in workshops that provide them with new ideas to improve work safety, as well as prevent risks and injuries at work. Vinodkumar and Bhasi (2010) found effective safety training as a key element in every successful organization, in any successful accident prevention program, as well as in any occupational safety and health program. Furthermore, safety training also provides the means to make accidents more predictable (Tinmannsvik & Hovden, 2003), as well as improves behavioral skills, related knowledge, and/or attitudes (Skjerve, 2008). Further improvement of the level of safety performance for all employees requires the organization to institute a systematic and comprehensive safety and health training program for new employees. Finally, safety issues are given high priority in training programs of employees. On this basis, training is supposed to be for all employees because adequate training allows them to face all kinds of risks and accidents at the workplace. Additionally, adequate training helps to reduce injuries and accidents in the workplace (Abdullah *et al.*, 2009; Vredenburgh, 2002).

The positive influence of safety training on safety performance is consistent with findings of several previous studies (Enshassi *et al.*, 2008; Huang *et al.*, 2006; Razuri *et al.*, 2007; Sgourou *et al.*, 2010; Tinmannsvik & Hovden 2003; Vinodkumar & Bhasi, 2010; Vassie & Lucas, 2001; Zacharatos *et al.*, 2005). Furthermore, Arboleda *et al.* (2003), Cohen *et al.* (1975), Lee (1998), Lin and Mills, (2001), Ostrom *et al.* (1993), Smith *et al.* (1975), Tinmannsvik and Hovden (2003), and Zohar (1980) found that companies with lower accident rates were characterized as providing good safety training for employees. Additionally, Hayes *et al.*(1998), Lingard *et al.* (2005), Krouse and Hidley (1989), Oltedal and McArthur (2011), O'Dea and Flin (2001), Wu *et al.*

(2003), Wang's (2002), as well as Wu *et al.* (2009) revealed that safety training significantly affected safety issues.

5.2.2.1.2 Rewards

This study hypothesized that rewards are positively related to safety performance (compliance with safety behavior and safety participation) [H1b and H1h]. Empirical support was found for these hypotheses. Employees perform better with regards to safety when they are rewarded than when they are not. This result suggests the importance of reward in encouraging employees to report hazards, create awareness among them, and report safety matters. According to Vredenburgh (2002), a well-designed reward system that offers recognition should be characterized by high visibility in the organization to help modify behavior toward employee safety at the workplace and thus prevent occupational accidents. Peavey (1995), and Thompson and Luthans (1990) confirmed that a reward must be directed toward the prevention of accidents rather than punishment after an accident occurs. Additionally, Gadd (2002) concluded that a reward can aid in the achievement of zero accidents by motivating employees to prevent accidents and by encouraging them to report immediately any accidents that occur. Furthermore, Ali *et al.* (2009) found that a reward can reduce injury rates. Hinze and Gambatese (2003), as well as Eiff (1999), found a significant positive effect between reward and safety behavior. Wiegmann *et al.* (2002) found rewards were an important factor for the continued success of the work of organizations because it is evidence of the safety culture in these organizations.

Consistent with other earlier findings, it appears that reward is a significant consideration in reduction of occupational accidents and injuries because it provides material and moral support for employees leading to improved safety performance.

5.2.2.1.3 Management Commitment

Management commitment was hypothesized to be positively related to safety performance (compliance with safety behavior and safety participation) [H1c and H1i]. Empirical support was found for these hypotheses or relationships. Employees who perceive that management is committed to safety tend to have better safety performance than those employees who do not have such perception.

Management commitment to safety refers to "the extent to which upper-level management identifies safety as a core value or guiding principle of the organization" (Fleming *et al*., 1996, p.78). Management commitment to safety refers to the degree at which top management identifies safety as a guiding principle of the organization. Thus, management commitment to safety is concerned with the ability of top management to show a positive attitude toward safety even during fiscal austerity, as well as in the active promotion of safety in a consistent manner across all levels of the organization (Fleming *et al*., 1996). Management commitment also concerned with efforts put in place by top management to make sure that every aspect of operations, including selection, procedures, training, equipment and work schedules, are administratively evaluated and modified to improve safety if need be (Wiegmann *et al.*, 2002).

The present result is thus in line with previous findings (Arboleda at el., 2003; Bailey, 1997; Choudhry *et al.*, 2008; Huang *et al.*, 2006; Wu *et al.*, 2008; Vredenburghm 2002; Vinodkumar & Bhasi, 2010) that reported a positive relationship between management commitment and safety performance. Additionally, many studies (e.g. Cox *et al.*, 2004; Diaz & Cabrera, 1997; Geldart *et al.*, 2010; Michael *et al.*, 2006; Miozza & Wyld, 2002; Smith *et al.*, 1978; Tharaldsen & Haukelid, 2009; Yule *et al.*, 2007) found a positive relationship between management commitment and low accident rates. Furthermore, other studies indicated a positive relationship between management and their level of commitment and employee's (Buchanan, 1974; DeCotiis & Summers, 1987; Dunham *et al.*, 1994; Meyer & Allen, 1991; Meyer *et al.*, 1993; Hall, 1977).

5.2.2.1.4 Communication and Feedback

This study hypothesized that communication and feedback are positively related to safety performance (compliance with safety behavior and safety participation) [H1d and H1j]. The hypotheses received empirical support. The results indicated that communication and feedback as a dimension of management practices was positively and significantly related to safety performance. Communication and feedback serve as key factors for the provision of information and data on the organizational safety level to determine the degree of risk attributable to accidents at work (Kletz, 1993).

This finding confirms the report of Vinodkumar and Bhasi (2010) that communication and feedback were collectively a vital factor in the safety issue pertinent to hazard reporting system, open door policy for safety issues, communication about safety goals and targets between managers and workers, as well as opportunity to discuss safety issues in meetings. Consequently, efficient communication and feedback helps management track errors in work and to correct deviations as soon as possible (Pandey & Garnett, 2006).

The present finding also appears to be consistent with those of previous scholars (e.g. Arboleda *at el.*, 2003; Bentley & Haslam, 2001; Cheyne *et al.*, 1998; Cox & Cheyne, 2000; Neal *et al.*, 2000; Wu *et al.*, 2008) who found communication and feedback to have a significant positive effect on safety performance. Additionally, other studies found a significant positive effect between communications and safety issue (e.g. Ali *et al.*, 2009; Cigularov *et al.*, 2010; Bentley & Haslam, 2001; DeJoy *et al.*, 2004; Hofmann and Morgeson, 1999; Parker *et al.*, 2001; Probst, 2004; Vredenburgh, 2002). For example, Lee (1998) demonstrated that communication and feedback led to lower rates of accidents at work and injuries. This is because the process of developing means of communication and speed of feedback play a role in the speed of response to accidents and reduce the losses and work-related injuries (Wu *et al.*, 2008). In a similar vein, Cohen (1977), Cox and Cheyne (2000), Mearns *et al.* (2003), and Mohamed (2002) argued that communication and feedback are significant considerations in reduction of occupational accidents because they provide information leading to the high level safety performance. Under these circumstances, employees need to be encouraged to communicate to give feedback and open communications about safety issues at the workplace via provision of hazard reporting system where they can communicate hazard information before incidents occur.

5.2.2.1.5 Hiring Practices

This study hypothesized that hiring practices are positively related to safety performance (compliance with safety behavior and safety participation) [H1e and H1k]. The hypotheses received empirical support. The results indicated that hiring practices as a dimension of management practices was positively and significantly related to safety performance. Employees who were hired well demonstrated safety performance better than those who were not hired based on good practices. Hiring practices refer to the process of developing criteria for hiring employees, including the selection of personnel who have the ability to understand the safety process and its importance in the organization (Eckhardt, 1996). The finding of the present study appears consistent with other studies (e.g. Collins & Clark, 2003; Kundu *et al.*, 2007; Huselid, 1995) that found a positive and significant relationship between hiring practices and safety performance. For example, Hussain (2009) found that hiring practices were an important factor to implement occupational safety and improve safety performance because of the procedures followed by the organization to obtain highly qualified personnel who are able to perform their jobs well. Additionally, Vredenburgh (2002) found a positive and significant relationship between hiring practices and reduced injury rates. It appears that hiring practices are significant consideration in prevention of accidents and injuries because they provide information leading to selection of new employees who have awareness and understanding about the safety issues in organization.

The current finding also appears to be consistent with previous studies that found hiring practices to have a positive significant relationship with job performance (e.g. Michie &

Sheehan- Quinn, 2001; Schuster, 1986; Vlachos, 2008; Zhn *et al.*, 2004). For example, Kor and Leblebici (2005) found that the hiring process must be based on the foundations and standards commensurate with the objectives of the organization and the nature of their work and the type of risks experienced because it is an important factor to improve the job performance in the organization. According to this paradigm, Cho *et al.* (2006) stated that hiring process is a key component of selective hiring through which the employees are identified to accomplish job performance. Paul and Anantharaman (2003) emphasized that an effective hiring practices ensure that employees have the right qualifications, thus resulting in improved job performance.

5.2.2.1.6 Employee Participation

This study hypothesized that employee participation is positively related to safety performance (compliance with safety behavior and safety participation) [H1f and H1l]. The hypotheses received empirical support. Employees with higher participation tended to have higher safety performance than those with lower participation. Since employees close to the work are best qualified to suggest improvements, they can be consulted before making final decisions, especially those affecting the employees and their safety (Dedobbeleer & Beland, 1991; Lee, 1998; Rundmo, 1994; Vredenburgh, 2002). Allowing employee participation in safety is considered a good management practice as employees are involved in safety committee comprising workers' representatives, safety-related decision-making and identifying safety problems. They are also committed about safety matters before any decision is taken.

The findings of the current study validate earlier works that examined the effect of employees' participation on safety performance (e.g. Ali *et al.*, 2009; Carder & Ragan, 2003; Costella *et al.*, 2009; Cheyne *et al.*, 2002; Hovden *et al.*, 2008; Lee, 1998; Johnstone *et al.*, 2005; Vinodkumar & Bhasi, 2010; Vredenburgh, 2002; Vassie & Lucas, 2001). Furthermore, other studies found a significant and positive relationship between employee participation and lower accident rates (Cohen, 1977; Cohen *et al.*, 1975; DePasquale & Geller, 1999; Griffiths, 1985; Harper *et al.*, 1997; Shafai-Sahrai, 1971; Shannon *et al.*, 1997; Smith *et al.*, 1975). According to Seligman (1991), employee participation means that employees have a substantial voice in safety decisions, have the leverage to initiate and achieve safety improvement, hold themselves and others accountable for their actions, and take pride in the safety performance record of their organization.

5.2.2.2 Leadership Styles

In this study, leadership styles refer to the particular style employed by those who are in positions of leadership (Ferrer, 2009). Leadership styles have been described to directly affect individual and organizational level outcomes (Bass, 1990: Yukl & Van Fleet, 1992). Consistently, leadership styles are important in safety issues through the formulation of a clear message on necessary future actions to address human errors or failure in reducing occupational accidents (Yang *et al.*, 2010). The present study employed two dimensions of leadership styles, namely, transformational and transactional leadership. The following discusses the results of each dimension.

5.2.2.2.1 Transformational Leadership

This study hypothesized that transformational leadership positively relates to compliance with safety behavior [H2a]. However, no empirical support was found, indicating that transformational leadership behavior of a supervisor will not result in employee adherence to safety performance procedures and performance of work in a safe manner. This finding appears to be consistent with that of other studies that found no significant effect of transformational leadership on compliance with safety behavior (Schutte, 2010; Yang, 2008). For example, Inness *et al.* (2010) conducted a study to examine transformational leadership and compliance with safety behavior in the US. They found transformational leadership to be unrelated to compliance with safety behavior.

Given that a transformational leader exhibits supportiveness and has a general concern for employees' well-being, it was expected that such leadership behavior would render employees more attentive to their own well-being, with one way of doing so is by complying with safety procedures. However, transformational leadership appeared not to affect whether employees follow work safety rules. One possible explanation for this finding may have to do with the nature of transformational leadership. In particular, higher levels of transformational leadership may indirectly give employees greater latitude to use their discretion in deciding whether to comply with existing organizational policies such as safety procedures, resulting in variability in individual safety compliance (Inness *et al.*, 2010)

The present study also hypothesized that transformational leadership positively relates to safety participation [H2c]. Empirical support was found; employees who perceived that their leader was exercising transformational leadership participated more in safety programs than those who did not perceive their leader as such. This finding appears to be consistent with that of other studies that demonstrated a significantly positive effect of transformational leadership on safety participation (McLeod, 2008). For example, Schutte (2010) found a positive relation between transformational leadership and safety participation in the construction sector in the Netherlands. Clarke and Ward (2006) conducted a study to examine the role of leader influence tactics and safety climate in employee safety participation in a manufacturing organization in the UK. The findings illustrated that leader influence tactics were associated with the transformational leadership style and had a significant relationship with safety participation. Similarly, Inness *et al.*, (2010) conducted a study to examine transformational leadership and safety participation in Syracuse University in the US. This study found transformational leadership to be positively related to safety participation.

The finding of the present study is consistent with the notion that transformational leadership serves to motivate superior employee contextual performance (Conger & Kanungo, 1988). The finding also suggests that transformational leadership does not need to have a safety-specific focus to motivate safety participation in employees. Generalized transformational leadership is an ongoing leadership style and can be used by supervisors to achieve a number of interpersonal and organizational goals, including encouraging employees to take extra measures to make the work environment safe.

Accordingly, it appears that transformational leadership is a significant consideration in safety participation because transformational leaders have the talent to motivate their followers or subordinates to commit themselves to safety participation beyond expectations. Additionally, transformational leadership promotes employee safety participation rules and regulations, and it encourages employee involvement in working in a safe manner across all industries. The present study indicates that transformational leadership could have an impact on the safety participation across work domains because transformational leader encourages employees to participate in decision making, articulates future plans for employees in an open way, conveys information in advance with employees with regard to safety issues.

5.2.2.2.2 Transactional Leadership

This study hypothesized that transactional leadership positively relates to both compliance with safety behavior and safety participation [H2b and H2d]. The hypotheses received empirical support. Transactional leadership results in the achievement of employee compliance, establishment of goals, monitoring performance, and reinforcing standards (Flin & Yule, 2004). Transactional leaders can entice their subordinates to perform and thereby achieve the desired outcomes by promising rewards and benefits for the accomplishment of tasks (Bass, 1990). Additionally, transactional leadership focuses on the link between rewards and performance and has also been called task-oriented leadership (Krause & Weekley 2005; Wu *et al.*, 2007), which is likely to be the main reason for the positive relationship between transactional leadership and safety performance.

The finding of the present study appears to be consistent with that of other studies that found a positive relationship between leadership and safety performance (Flin & Yule, 2004; Lee, 2002; Wu, 2008; Pater, 2001; Wu *et al.*, 2008; Zohar, 2003). For example, Yule *et al.* (2007) found such a significant positive effect because transactional leadership facilitates lower accident rates by focusing on the reward factor. Further investigating the role of transactional leadership, Sønderstrup–Andersen *et al.* (2011) found that transactional leadership had a significant positive association with management safety. Moreover, Kivimaki *et al.* (1995) found that transactional leadership behaviors were effective in reducing injury rates at work. In a similar vein, Zohar (2002) demonstrated that the relationship between transactional leadership and safety climate could be explained by a supervision-based safety model, where workplace safety is facilitated by a leaders' who closely monitors and provide verbal feedback. In sum, it appears that transactional leadership is a significant consideration in safety performance because transactional leaders evaluate and explain the goals for their subordinates, and suggest how to operate the tasks. In other words, a transactional leader identifies and clarifies job tasks for the followers or subordinates and communicates how successful execution of those tasks, which enhances safety performance.

5.2.3 Interacting Effects

Two general hypotheses were formulated on personality traits moderation: (1) H3: Personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) were hypothesized to moderate the relationship between management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation) and safety performance (compliance with safety behavior and safety participation) and (2) H4: Personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) were expected to moderate the relationship between leadership styles (transformational and transactional leadership) and safety performance (compliance with safety behavior and safety participation). Personality traits refer to the dynamic set of characteristics of a person, which uniquely affect his or her cognitions, motivations, and behavior in various situations (Ryckman, 2004). Moreover, personality traits refer to characteristics that are stable over time and psychological in nature. These traits reflect who we are and, in aggregate, determine our affective, behavioral, and cognitive styles (Mount *et al.*, 2005).

The results of the hierarchical regression analysis in the previous chapter partially supported the hypothesis that personality traits moderate the relationship between management practices and safety performance (compliance with safety behavior and safety participation) [H3], as well as the hypothesis that personality traits moderate the relationship between leadership styles and safety performance (compliance with safety behavior and safety participation) [H4]. Although intuitively appealing, no study has thus far assessed the possible moderating role of personality traits on the relationship between management practices and leadership styles, specifically in light of safety performance. Moreover, studies that examined personality traits as a moderator have focused on attitude toward advertisements and purchase intentions (Myers *et al.*, 2010); people management and organizational citizenship behavior (Chou, 2009); self-other agreement and informant consensus (Biesanz & West, 2000), demographic risk on parenting (Kochanska *et al.*, 2007); video games and violence (Markey & Markey, 2010); communication and couple stability (Lazaridè *et al.*, 2010); workplace monitoring system characteristics, fairness, privacy, and acceptance (Zweig & Webster, 2003); social structural characteristics and employee empowerment (Samad, 2007); as well as perceptions of organizational justice and sickness absence (Elovainio *et al.*, 2003). These studies were similar to one another because the dependent variables were measured at the individual level, but the application fields and issues differ. On the other hand, the present study measured the dependent variable also at the individual level, but with a safety issue in the O&G industry, thereby making it different from other studies. Thus, the findings of the present study are preliminary and should be interpreted with some caution. In the present work, 15 moderating effects were found of personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) on the relationship between dimensions of management practices and safety performance. Additionally, three moderating effects were found of personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) on the relationship between dimensions of leadership styles and safety performance.

The following section explains the moderating effect of personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) on the relationship of management practices and leadership styles with safety performance.

5.2.3.1 Extraversion as a Moderator of the Relationship of Management Practices and Leadership Styles with Safety Performance

This study hypothesized that extraversion moderates the relationship between management practices and leadership styles with safety performance. As indicated in the result section the hierarchical regression analysis showsfour interaction terms. The use of the graphical method and split model regression revealed that the interactions between (1) management commitment × extraversion; (2) hiring practices × extraversion; (3) safety training × extraversion; and (4) participation × extraversion were significant.

The findings obtained in this study appear consistent with those of other scholars who found extraversion to have a moderating effect (Metsa¨pelto & Pulkkinen, 2005; Lin & Ong, 2009; Judge & Larsen, 2001; Jung *et al*., 2012; Oishi & Schimmack, 2010; Krishnan & Lim, 2010; Jacobs *et al*., 2012). For example, Matz *et al*. (2008) studied the relationship between cognitive dissonance and disagreement. The study found that extraversion moderates the relationship between feelings of cognitive dissonance and disagreement. This was later explained by the vulnerability to arousing experiences. Similarly, Colquitt *et al*. (2006) examined extraversion as moderating variable on the relationship between counter productive behavior and task performance. Likewise, Benoliel and Somech (2009) also found that extroversion moderates the relationship between participative management and teacher performance. Following are some of the plausible explanation to justify the obtained findings.

1. It was found that high management commitment further enhanced safety compliance of extroverts while low management commitment was found to enhance safety compliance among introverts. Aplausible explanation would be that extroverts being individuals who are outgoing and conversation starter would have better compliance under conditions of high management commitment because they tend to be comfortable with management and in complyingwith the safety behavior (Jacobs *et al*., 2012). Because management that is high in commitment in safety tends to give extroverts who are proactive more opportunities to actively more engaged in safety seeking behaviors(Costa & McCrae, 1992; Jackson, 1984). While introverts being those in the background would be looking for safety information on their own and do not rely on others could have more information on safety therefore having better compliance to safety behavior (Krishnan & Lim, 2010).

2. When organizations have unfavorable hiring practices, compliance with safety behavior tends to be high among extroverts. This is because extroverts will be proactive in gathering safety information from others probably because of poor orientation and socialization opportunity (Benoliel & Somech, 2009). But when organizations's hiring practices are favorable, it is the introverts who tend to comply more with safety behavior. Introverts being those who are working behind the limelight could have gathered their own information on safety information as compared to the extroverts who rely on others (Lin &Ong, 2009).

This is because they would not be comfortable with formalities such as proper orientation sessions and socialization sessions.

3. Regardless of whether organizations offer much training or a lot of training, extroverts tend to participate more in safety activities. Because extroverts by nature are proactive (Geller, 2001; Krause, Hidley, &Hodson, 1996), they will be more active (Caldwell & Burger, 1998; Bauer *et al*., 2006) and constantly engaging in seeking advice or seeking opportunity to be trained so that they can perform their job safely (Wanberg & Kammeyer-Mueller, 2000). Hence, when the organization provides much training, extroverts tend to participate more in safety program as training allows them to interact more and participate more with people on safety issues. However, even though the organization does not provide much training, extroverts still participate in safety initiative because they are known to be proactive and outgoing (Geller, 2001; Krause *et al*., 1996).

4. Similarly, regardless of whether organizations allow much or extensive employee participation, extroverts tend to participate more in safety initiatives. This is because extroverts, by nature, like to participate actively (Zhao & Seibert, 2006) and are also referred to as initiators who love others to also participate (Oishi & Schimmack, 2010). Hence, whether the organization a formal structure that allows employee participation at the organizational level, this does not deter extroverts from giving ideas about safety issues or take part

in safety programs as safety issues are collective issues that affect other people directly and indirectly (Scholz & Gray, 1997).

5.2.3.2 Conscientiousness as a Moderator of the Relationship of Management Practices and Leadership Styles with Safety Performance

It was hypothesized that conscientiousness would moderate the relationship between management practices and leadership styles, and safety performance. The results indicate that three interaction terms that involve the use of the graphical method and split model regression revealed that the interactions between (1) communication and feedback × conscientiousness (in both compliance with safety behavior and safety participation); and (2) hiring practices × conscientiousness, were significant.

The finding appears to be consistent with other scholars who found conscientiousness to have a moderating effect (Afsar *et al.*, 2011; Bennett *et al*., 2001; Baker & McNulty, 2011; Demerouti, 2006; Lazaridès *et al*., 2010; Zweig & Webster, 2003; Kochanska *et al*., 2007; Ziegler *et al.*, 2009). For example, Chou (2009) examined the moderating effect of conscientiousness on the relationship between people management and organizational citizenship behavior. The study found conscientiousness moderates the association. Similarly, Sansa (2010) found that conscientiousness moderates the relationship between psychological demands and psychological distress. On another note, Grant (2008) conducted a study between task significance and job performance and found that conscientiousness moderates the effects of task significance on the performance of new fundraising callers.The next part offers possible explanation for the moderating influence of conscientiousness in the present study.

1. Regardless of whether an organization providescommunication and feedback, high conscientiousness employees tend to comply more with safety behavior and participate more in safety initiatives. High conscientiousness employees have the desire to fulfill their obligations toward task accomplishment (Demerouti, 2006), and understand the cost and consequences of a workplace accident (Neal & Griffin, 2006). So when the organization provides active communication and feedback that will enable them to further understand accidents and injuries at the workplace(Afsar *et al*., 2011), they will be likely to comply more with and participate more in safety programs (Henning *et al*., 2009). Even when there is lack of communication and feedback given, conscientious employees still comply and participate because they understand the ramifications for not doing so.

2. Regardless of whether the organization is having a good hiring practice or not, safety high conscientiousness employees tend to participate more. High conscientiousness employees strive for task accomplishment (Baker & McNulty, 2011) by being meticulous, thorough, neat, well-organized, able to hold their impulses in check, dedicated to their goals, persistent, dependable, trustworthy, industrious, and achievement-striving (Digman, 1990; McCrae & John, 1992; Roberts *et al*., 2005). In both conditions of high and low hiring practices they tend to have better safety participations mainly owing to their personality characteristics. High conscientiousness employees have important characteristics

in workplace accident prevention as they tend to be very meticulous, thorough, and well organized (Fernandez-Muniz *et al.*, 2007).

5.2.3.3 Intellect as a Moderator of the Relationship of Management Practices and Leadership Styles with Safety Performance

Intellect is the third personality trait that is hypothesized to moderate the relationship between management practices and leadership styles, and safety performance. The results of the study revealed that (1) communication and feedback × intellect (in both compliance with safety behavior and safety participation); and (2) transactional leadership × intellect, had significant interactions.

The present study finding was found to be consistent with other scholars who found intellect to have a moderating effect (Alexander, 2009; Caldwell, 2000; Caligiuri, 2000; Klehe & Anderson, 2007). For example, Halbinger (2012) conducted a study on motivation and entrepreneurship and found that intellect moderated the effects of entrepreneurship. Similarly, studies have revealed that intellect moderates the relationship between experienced creative time pressure and creativity (Baer & Oldham, 2006). Wu *et al*. (2011) conducted a study on motivation, opportunity, and ability to share knowledge and found that intellect moderated the effects of knowledge sharing. On a similar note, intellect was found to be moderating the relationship between career management and affective organizational commitment (Ronn, 2010). Further, Vaughn, Baumann and Kleman (2008) conducted a study on the motivation of pursuing hopes and aspirations and found that intellect moderated the effects of aspirations. Following are some plausible explanation for the moderating influence of intellect.

1. Regardless of whether an organization provides constant and active feedback and communication with regard to safety, employees with high intellect trait showed enhanced compliance with safety behavior and safety participation. Employees with high intellect personality seem to thrive in situations that require flexibility and access to new information to learn new skills (Alexander, 2009; Klehe & Anderson, 2007) especially when they are given much feedback about their safety performance. In this condition, they are more likely to be more safety compliant and participate more in safety programs. Similarly employees with high intellect traits tend to gather information and learn new skills even when there is low communication and feedback because they are by nature people who seek new information and skills, which allow them to understand the importance of better compliance with safety behavior and safety participation in reducing accidents and injuries at the workplace (Ronn, 2010).

2. Regardless of whether the leader uses highor low transactional style, employees with high intellect tend to participate more in safety initiatives. Since highly intellectual person understands the need and importance to thrive safe behavior at work (Baer & Oldham, 2006; Klehe & Anderson, 2007), it is not surprising that regardless of the condition they are in they still comply with safety standards and participate in safety programs. In fact, when the leader is not providing the necessary guide and direction, employees with high intellect tend to comply more because their trait facilitates them to acquire and learn new things (Alexander, 2009; Klehe & Anderson, 2007).

5.2.3.4 Agreeableness as a Moderator of the Relationship of Management Practices and Leadership Styles with Safety Performance

The fourth personality trait that moderated the relationship between management practices and leadership style with safety performance was agreeableness. The results indicated that the interactions between (1) reward × agreeableness (in both compliance with safety behavior and safety participation); (2) transactional leadership × agreeableness; (3) management commitment × agreeableness; (4) communication and feedback × agreeableness; and (5) transformational leadership × agreeableness, were significant.

These are very much consistent with a number of previous studies (Benoliel&Somech, 2009; Meier *et al*., 2006; Jacobs *et al*., 2012; Wang *et al*., 2010) that found agreeableness to have a positive moderating effect. For example, Simon *et al*. (2010) found that agreeableness moderates the relationship among co-worker, job, and life satisfaction. Similarly, Klehe and Anderson (2007) conducted a study among typical versus maximum performance situations and social loafing and found that agreeableness has a moderating effect. On another note Jensen–Campbell and Graziano (2001) found that agreeableness was moderating the relationship affective responses and tactical choices during conflicts. Following are some possible explanation for the moderating effect of agreeableness in this study.

1. Regardless of whether there is favorable reward or otherwise, employees exhibiting high agreeableness trait have superior compliance with safety behavior and safety participation compared to those exhibiting low

agreeableness trait. High agreeableness employeesare known to have high desire to cooperate and build relationship (Colquitt *et al*., 2006), desire in cooperation (Neuman & Wright, 1999). They are also empathetic, helpful, and prefer working in teams (Jacobs *et al*., 2012). As accidents and injuries at the workplace normally affect others directly or indirectly, people with such characteristics tend to show higher compliance with safety behavior and safety participation because they understand the importance of being safe at work. Such behavior is more enhanced when it is rewarded. But even when helping other employees to observe safety standards and procedures is not rewarded, employees who are high in agreeableness still comply and participate in safety program because they understand that accidents and injuries can be minimized as a result of a collective effort (Scholz & Gray, 1997).

2. Regardless of whether the leader uses high or low transactional style, employees high in agreeableness tend to comply more with safety behavior. Characteristics such as being pleasant, accommodating, friendly (Benoliel & Somech, 2009) would facilitate better compliance with safety behavior further more when the leadership style is concerned with guiding the employees about what safety behavior needs to be demonstrated (Krouse, 2009). However, even when the leader does not guide explicitly guide employees on safety, employees high in agreeableness still comply with safety behavior because agreeableness tend to be tolerant and conform to group norms (Tett & Burnett, 2005) and adapt to changes in the social context (Neal *et al.*, 2012).

3. Regardless of whether management is highly committed or not with safety, employees exhibiting high agreeableness trait personality tend to participate more in safety programs. Employees who are high in agreeablenessare friendly, tolerant, helpful, altruistic, modest, trusted, and straight for ward (Graziano *et al*., 1997). They also seem to facilitate interpersonal attraction (Wang *et al*., 2010), and promote cooperation (Jeffcott *et al*., 2006). These characteristics will facilitate better safety participation when the management is also committed to play its role. But when management is not committed, employees high in agreeableness still participate in safety programs as they are noted to be conforming to group norms and easily adapting to the social context (Neal *et al*., 2012; Tett & Burnett, 2005).

4. When the organization provides active and constant communication and feedback to employees, highly agreeable employees tend to have enhanced safety participation. As highly agreeable employees have high desire to cooperate, build relationship, and are optimistic (Simon *et al.*, 2010), they tend to show greater participation in safety initiatives because such behavior is the desired behavior communicated to them by the organization. But even when the organization does not provide active communication and feedback about what needs to be done, employees high in agreeableness still participate in safety program because they are prone to be conforming to group norms and easily adapting to the social context (Neal *et al*., 2012; Tett & Burnett, 2005).

5. Regardless whether a leader shows high or low transformational leadership, employees with high agreeableness trait tend to have enhanced safety participation. Employees with high agreeableness trait are optimistic and like to lead (Adamshick, 2007). As such transformational leadership offers new ideas to transform the workplace would be the leaders that high agreeableness employees want to work together (Johnson, 2007) as they tend to change the current work environment while employees high in agreeableness would be receptive to these novel ideas and behaviors (George & Zhou, 2001). These match of employee personality trait and leadership style would facilitate better safety participation.

5.2.3.5 Emotional Stability as a Moderator of the Relationship of Management Practices and Leadership Styles with Safety Performance

The fifth personality trait that moderated the relationship between management practices and leadership style with safety performance was emotional stability. The results indicate that (1) communication and feedback × emotional stability; and (2) hiring practices × emotional stability were the only significant interaction terms.

The findings are consistent with previous studies conducted by Chou (2009), Clarke, (2004), Barrantes–Vidal *et al*. (2009), Krishnan and Lim (2010), Myers *et al*. (2010), and Zweig and Webster, (2003) who all found that emotional stability has a moderating effect. For example, Kammeyer–Mueller *et al.* (2009) conducted a study among stressors and strain and found that emotional stability was uniquely related to stress and the coping process and that emotional stability moderated the relationship between stressors and strain. Likewise, Mikolajczak *et al*. (2009) conducted a study on stress in relation to memory and attention and found that emotional stability has a significant moderating effect on the relationship between stress and attention. Following are some possible explanation on the moderating effect of emotional stability in the present study.

1. When an organization does not provide active and constant communication and feedback, employees with high emotional stability tend to comply more with safety behavior. But when communication and feedback are actively and constantly provided, employees with low emotional stability tend to comply more with safety behavior. High emotional stability employee is known to be not vulnerable to stress of not knowing how to work safely (Myers *et al*., 2010). Therefore, even though they are not informed about their performance, such situation does not deter them to comply with safety behavior. But when the organization does not provide much feedback, low emotional stability employees will start worrying (Cigularov *et al*., 2010), getting easily upset (Wu *et al*., 2008), and getting irritated easily (Siu *et al*., 2004). Hence, employees with low emotional stability tend to appreciate the active communication and feedback so that they know what to do to protect them selves from danger.

2. Regardless of whether an organization is having a good hiring practice or not, employees with low emotional stability tend to have enhanced safety participation. Characteristics of low emotional stability employees are being prone to anxiety and fear (Judge & Larsen, 2001) are also pessimistic with work outcome (Colquitt *et al*., 2006). A plausible explanation could be that as the

level of emotion rises participation improves because it helps employees concentrate on relevant hazard cues and exclude irrelevant ones (Le *et al*., 2011). In addition, Nettle (2006) argued that low emotional stability is not always detrimental to performance; in fact to a certain extent it facilitates participation in safety programs due to anticipatory ability.

5.3 IMPLICATIONS

Findings from this study have several important implications, both to practice and theory. The first section will discuss the managerial implications, whereas the second section will detail the theoretical implications.

5.3.1 Managerial Implications

The first objective of the study was to determine the safety performance level of the employees in the oil and gas industry in Iraq. The study revealed that the safety performance level was low compared to the previous study. As such the standards of occupational safety in the Iraq oil and gas need to be increased. This needs a collaborative effort from three parties namely government, employers, and employees.

The government:

1. Launch a national campaign to raise awareness among workers in the oil sector in order to encourage them to abide by the rules and safety conditions in the workplace.

2. Adopt a clear strategy to raise the level of safety and face occupational accidents in all oil companies in Iraq, and benefit from the experiences of Asian oil countries in this regard, especially Malaysia and the Gulf countries.
3. Apply the principle of irregularities and severe sanctions on oil companies, which will decrease the occupational accidents and increase level of safety.

The employers:

1. Promote a culture of safety in the organization and raise the banner of “safety first”.
2. Form work teams to disseminate the principles and methods of safety within the organization and take advantage of the trade unions to achieve this goal.
3. Build a database of (reasons, types, and repeat) occupational accidents in the organization.

The employees:

1. Understand that safety at workplace is everyone's responsibility, and each person monitors the level of safety in the organization.
2. Get sufficient amount of information about the types of risks they face and ways to address them.
3. Focus on safe and at-risk behaviors and provide safety feedback to coworkers.

On the other hand, this study found management practices and leadership styles to be associated with safety performance. Hence, the present findings have some contribution toward human resource management activities, such as training, management commitment, employee participation, communication and feedback, hiring practices, and reward. First, the findings of this study have some implications to training activities conducted by firms in the Iraqi O&G industry. Training is defined as a learning process that involves the acquisition of knowledge, sharpening of skills, concepts, rules, or changing of attitudes and behavior to enhance the performance of employees (Jackson, 1995). Additionally, training is an activity resulting in skilled behavior (Dimba & K'Obonyo, 2009). At present, given the multiple sources of risk and the diversity of occupational accidents and injuries especially in industrial companies, increasing attention is directed toward training programs for employees and managers (Tinmannsvik & Hovden, 2003) toward the prevention of accidents and injuries and the improvement of safety performance (Razuri *et al.*, 2007; Petrovic–Lazarevic *et al.*, 2007). Previous studies have suggested that such training programs are an important determinant of safety performance, particularly under high risk work and high stress conditions in the face of occupational accidents (Jaselskis *et al.*, 1996; Katou & Bedhwar, 2006; Mearns *et al.*, 2003; Petrovic-Lazarevic *et al.*, 2007). The current findings indicate that trainings are associated with positive safety performance. Hence, training programs can help employees reduce occupational accidents and injuries at the workplace. Therefore, this study emphasizes the importance of training workers in the O&G companies.

Secondly, the findings of the study also have some implications to the management commitment activities conducted by companies in the Iraqi O&G industry. Management commitment is defined as engaging in and maintaining behavior that helps others achieve a certain goal (Cooper, 2006). Management commitment involves, among others, the willingness of leaders to exert efforts for managers to be accountable for the safety of all employees in the organization and ensure that work is done under a high level of commitment to safety (Garrett & Perry, 1996; Smith *et al.*, 1978). As it was found that management commitment was associated with positive safety performance.

Employee participation is defined as any procedure, including information, consultation, and participation that employee trustees can use to influence decisions (Muda, 2008). Employee participation involves, among others, the level of empowerment that the employee possesses when facing safety issues at work. Therefore, the primary practical step in achieving safety performance is to give due attention to employees and consider the level of employee participation in safety issues at the workplace (Gunawan, 2006). The current findings indicated that employee participation was associated with positive safety performance. Therefore, O&G companies should give due attention to employees by allowing them to participate in decisions related to safety and participation in drawing policies and strategies.

Moreover, the findings of this study have some implications to the communication and feedback activities conducted by companies in the Iraqi O&G industry. Communication and feedback is defined as the provision of information and data on the safety level of the organization to determine the degree of risk attributable to accidents at work (Kletz, 1993). Efficient communication and feedback helps management track errors at work and correct deviations as soon as possible (Pandey & Garnett, 2006). Communication plays a vital role in the success of every organization and individual in the completion of work and achievement of desired goals (Eshraghi & Salehi, 2010). The current findings indicated that communication and feedback was positively associated with safety performance. Therefore, O&G companies need to encourage the communication and feedback process through the filing of complaints to determine the views of employees about safety in the workplace, specifically their complaints and suggestions.

Fifthly, this study also has some implications to the hiring practices of companies in the Iraqi O&G industry. Hiring practice is defined as the process of developing criteria for hiring employees, including the selection of personnel who have the ability to understand the safety process and its importance to the organization (Eckhardt, 1996). Hiring practices aim to ensure that the appropriate employees are selected for the right position (Turner, 1991). The current findings indicated that hiring practices were associated with positive safety performance, thus confirming the role of hiring practices in reducing accidents and injuries in the workplace. Therefore, O&G companies should strengthen the activity of hiring practices for new employees.

Finally, this study also contributes to the reward system for improving safety performance. A reward is defined as an incentive given to an employee that can either be tangible or intangible with the purpose of encouraging the positive attitude of employees to improve performance (Cabrera *et al.*, 2007). A reward also refers to the motivation of employees to complete their work to the fullest (Bentley &Haslam, 2001). Several studies have shown that reward plays a direct role in motivating employees to perform creatively (Eisenberger, 1992; Eisenberger *et al.*, 1998; Eisenberger & Rhoades, 2001). Other studies have found a positive relationship between reward and employee performance (Tsai, 2005; Oluleye, 2010; Berndardin & Russel, 1993). The current findings indicated that a reward was associated with positive safety performance because the active principle of a reward in safety issues is the improvement of safety performance in the organization. Therefore, this study emphasizes the importance of reward system in O&G companies.

5.3.2 Theoretical Implications

Findings from the main and interacting effects of the present study have extended beyond findings of previous studies and thus have contributed new information to the body of knowledge in safety performance research. Firstly, findings from this study contribute to the empirical research on the relationship between management practices, leadership styles and safety performance, thus offering empirical validation to the theoretical justification of social exchange theory (Gouldner, 1960)in the Iraqi O&G industry, which suggests that as one party acts in ways that benefit another party, an implicit obligation for future reciprocity is created.

In the present study personality traits were found to moderate the relationship between management practices, leadership style, and safety performance. The role of personality traits in occupational safety is important as it enhances understanding of the diversity of individual differences in accident and injury prevention. Hence, future researchers may consider incorporating relevant personality traits in their works in safety.

In summary, findings of this study, to the author's knowledge, comprise the first piece of empirical research on the moderating effect of personality traits on the relationship of management practices and leadership styles with safety performance in the Iraqi O&G industry. Thus, this study adds to the existing knowledge of management studies on the combined effect of management practices, leadership styles, and personality traits and their effect on safety performance. This study contributes further to the current body of knowledge by individually investigating the effects of personality traits and linking them with management practices, leadership styles, and safety performance dimensions. The results partially support the interaction effect of management practices, leadership styles, and personality traits in relation to safety performance. Nevertheless, the overall results indicate that some dimensions of management practices, leadership styles, and personality traits had significant interactions. Hence, the role of these management approaches in complementing one another should be recognized.

5.4 LIMITATIONS OF THE STUDY AND DIRECTIONS FOR FUTURE RESEARCH

This study has provided some insight into the importance of management practices and leadership styles in safety performance. However, this research has several notable limitations, both conceptual and methodological. Firstly, this study examined safety performance from a management perspective. Other factors, such as safety culture and safety climate, may also contribute to or interfere with safety performance (Cooper & Phillips, 2004; Clisnold, 2004; Mearns& Yule, 2009; Mearns *et al.*, 2003; Yule &Flin, 2007). The exclusion of these factors is a recognized limitation on the generalizability of the present result. Secondly, this study is subjected to several shortcomings that limit the interpretation of the findings. One of the limitations of this study is the use of a cross-sectional design for survey research, which captures the perceptions of participants at a point in time. Thus, the study cannot prove causal relationships on a longitudinal basis and so limited in explaining factors influencing safety performance more comprehensively. Thirdly, the findings may not be generalized in a larger context across cultures of other industries because the data collected from this study were limited to the Iraqi O&G industry. Different industries and business environments may differential effects of management practices, leadership styles, and personality traits on safety performance, so other studies can explore their relationships in different contexts. Finally, generalizability is also difficult because the sample came from one company (i.e. South Gas Company) in Iraq. The results may be applicable to employees in this company only. However, the findings of this study can be useful to O&G industries in any country considering the modern standards for safety that are found in the general industry.

While there are limitations that should be recognized when interpreting the findings of this thesis, the present study also recognizes opportunities for further research. Future research directions derived from this study can be summed up as follows. First, further research to examine the generalizability of the results is required to enhance the effect of the factors and measurement tools on the improvement of safety performance in the O&G industry through other variables, such as safety culture and safety climate. Second, given that the survey research in this study was based on a cross-sectional design, further work needs to be conducted to establish the effect of changes over a longer period of time in the aspects of management practices, leadership styles, and personality traits. Therefore, future research should consider longitudinal studies to examine how safety performance is affected by management practices, leadership styles, and personality traits. Third, the study sample is limited to the O&G industry in Iraq. Future research should consider replicating this study in other cultures or countries, especially in terms of the moderating effect of personality traits. In addition, future research should also be conducted in other sectors or industries aside from O&G, such as manufacturing, petrochemical, chemical fertilizers, and iron and steel, to broaden the knowledge about the factors that contribute to the improvement of safety performance in Iraq. Finally, given that this study employed a quantitative technique in its design and analysis, the information gathered is limited to the questionnaire responses. The use of qualitative techniques should be incorporated in further research because this approach provides insights into and understanding of the problem setting. Results of this study would be more meaningful if both quantitative and qualitative techniques are employed because these approaches complement each other.

5.5 CONCLUSION

The present study has identified several gaps that still exist in the current safety performance literature on the relationship of management practices and leadership styles with safety performance. Previous studies in this area did not address the following issues in their research: (1) examination of the effect management practices and leadership styles on safety performance, (2) the level of safety performance, and (3) possible moderators of the relationship of management practices and leadership styles with safety performance. This study has contributed to this body of knowledge by examining the effect of management practices and leadership styles on safety performance, which included personality traits as a moderator. Thus, the current attempt has managed to fill the gaps that exist in the safety performance literature.

This study has generally found that the level of safety performance in the Iraqi O&G industry is low compared to that in manufacturing industry in Iraq. This requires that the managers in the O&G industry in Iraq improve the level of safety performance because the industry is naturally a risky industry. This study also found that management practices (safety training, reward, management commitment, communication and feedback, hiring practices, and employee participation) were significantly related to safety performance (compliance with safety behavior, and safety participation). Additionally, the current study found that transactional leadership was significantly related to compliance with safety behavior, and safety participation and transformational leadership significantly related to safety participation but not significantly related to compliance with safety behavior. Furthermore, this study found that personality traits (extraversion, conscientiousness, intellect, agreeableness, and emotional stability) can serve as a moderator of the relationship of management practices and leadership styles with safety performance.

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Appendix A

English Questionnaire

Date: / / 2011

Dear respondent:

I am a graduate student of Universiti Utara Malaysia and conducting a survey regarding safety performance, to fulfill the PhD requirement of the university. The objective of this study is to help me understand the relationship between management practices, leadership styles, personality traits and safety performance.

I realize that your time is valuable and many demands are made upon it by your heavy workload. However, your participation in this survey, which will require only about 10-15 minutes of your time, is vital to the success of this study.

Please be rest assured that all your responses will be kept strictly confidential and I will keep your identity anonymous. All the data will be aggregated and will be strictly used for academic purposes only.

I looking forward to complete my questionnaire best to your convenience and later I can revisit you to collect it back.

If you are interested in this study please contact me through email at wameedh01@yahoo.com or call me at: 07801395473.

Thank you in advance for your cooperation.

Sincerely,

Wameedh A. Khdair
PhD Management Candidate
College of Business
Universiti Utara Malaysia
06010 Sintok Kedah

SECTION A: DEMOGRAPHIC INFORMATION

Please fill in blank and tick (✓) in the appropriate boxes that corresponds to the questions below.

1. Job title: ____

2. Gender: ❒ Male ❒ Female

3. Age: ______________________________________ years old.

4. Educational level: ❒ Secondary school ❒ Diploma
   ❒ Certificate in O&G ❒Master's degree
   ❒ Bachelor's degree ❒PhD

5. Marital status: ❒Married ❒Single ❒Divorced/widowed

6. Have you ever had any occupational accident ever since you started working in this company?
   ❒ Yes ❒ No

   If yes, how many accidents have you had while working in this company?
   ❒1 - 3 ❒ 4 – 8
   ❒9 – 15 ❒ Over 15

7. How long have you been working with the present company? ___________ Years.

SECTION B – MANAGEMENT PRACTICES

Following are questions pertaining to management practices. Considering only the company where you work, please circle the appropriate number on the 5 Likert scale which consists of 1 (Strongly Disagree) 2 (Disagree) 3 (Neutral) 4 (Agree) 5(Strongly Agree) that best describes your response. Please keep your response general to your company as a whole.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.	My company gives comprehensive training to the employees in workplace health and safety issues.	1	2	3	4	5
2.	Newly recruits are trained adequately to learn safety rules and procedures.	1	2	3	4	5
3.	Safety issues are given high priority in training programs.	1	2	3	4	5
4.	I am not adequately trained to respond to emergency situations in my workplace.	1	2	3	4	5
5.	Management encourages the workers to attend safety training programs.	1	2	3	4	5
6.	Safety training given to me is adequate to enable to me to assess hazards in workplace.	1	2	3	4	5
7.	I think that work-related injuries are due to a lack of rewards for reporting hazards.	1	2	3	4	5
8.	I think the employees are rewarded for reporting a safety hazard (e.g., thanked, have employee recognized in hospital newsletter, receive cash or other awards).	1	2	3	4	5
9.	I think the employees are punished for reporting a safety hazard (e.g., they are ignored or told to keep it quiet).	1	2	3	4	5
10.	Safety is given high priority by the management.	1	2	3	4	5

11.	Safety rules and procedures are strictly followed by the management.	1	2	3	4	5
12.	Corrective action is always taken when the management is told about unsafe practices.	1	2	3	4	5
13.	In my workplace managers/supervisors do not show interest in the safety of workers.	1	2	3	4	5
14.	Management considers safety to be equally important as production.	1	2	3	4	5
15.	Members of the management do not attend safety meetings.	1	2	3	4	5
16.	I feel that management is willing to compromise on safety for increasing production.	1	2	3	4	5
17.	When near-miss accidents are reported, my management acts quickly to solve the problems.	1	2	3	4	5
18.	My company provides sufficient personal protective equipments for the workers.	1	2	3	4	5
19.	My company doesn’t have a hazard reporting system where employees can communicate hazard information before incidents occur.	1	2	3	4	5
20.	Management operates an open door policy on safety issues.	1	2	3	4	5
21.	There is sufficient opportunity to discuss and deal with safety issues in meetings.	1	2	3	4	5
22.	The target and goals for safety performance in my organization are not clear to the workers.	1	2	3	4	5
23.	There is open communications about safety issues in this workplace.	1	2	3	4	5
24.	I think the employees hired should be based on a good safety record in their previous position.	1	2	3	4	5

25.	I think the management seeks to have information about job candidates' prior safety performance in selecting or transferring employees.	1	2	3	4	5
26.	I think that work-related injuries are due to a lack of hiring people who are safety conscious.	1	2	3	4	5
27.	Management always welcomes opinion from employees before making final decisions on safety related matters.	1	2	3	4	5
28.	My company has safety committees consisting of representatives of management and employees.	1	2	3	4	5
29.	Management promotes employees involvement in safety related matters.	1	2	3	4	5
30.	Management consults with employees regularly about workplace health and safety issues.	1	2	3	4	5
31.	Employees do not sincerely participate in identifying safety problems.	1	2	3	4	5

SECTION C – LEADERSHIP STYLES:

Following are questions pertaining to leadership styles. Considering only the company where you work please circle the appropriate number on the 5 Likert scale which consists of 1 (Strongly Disagree) 2 (Disagree) 3 (Neutral) 4 (Agree) 5(Strongly Agree). That best describes you response.

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
My leader…					
1. Instills pride in me.	1	2	3	4	5
2. Spends time teaching and coaching.	1	2	3	4	5
3. Considers moral and ethical consequences.	1	2	3	4	5
4. Views me as having different needs, abilities, and aspirations.	1	2	3	4	5
5. Listens to my concerns.	1	2	3	4	5
6. Encourages me to perform.	1	2	3	4	5
7. Increases my motivation.	1	2	3	4	5
8. Encourages me to think more creatively.	1	2	3	4	5
9. Sets challenging standards.	1	2	3	4	5
10. Gets me to rethink never-questioned ideas.	1	2	3	4	5
11. Makes clear expectation.	1	2	3	4	5
12. Will take action before problems are chronic.	1	2	3	4	5
13. Tells us standards to carry out work.	1	2	3	4	5
14. Works out agreements with me.	1	2	3	4	5
15. Monitors my performance and keeps track of mistake.	1	2	3	4	5

SECTION D – PERSONALITY

Following are nine questions pertaining to personality. Considering only the company where you work please circle the appropriate number on the 5 Likert scale which consists of 1 (Very Inaccurate) 2 (Moderately Inaccurate) 3 (Neither Accurate Nor Inaccurate) 4 (Moderately Accurate) 5(Very Accurate). That best describes you response.

	Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
1. I feel comfortable around people.	1	2	3	4	5
2. I start conversations.	1	2	3	4	5
3. I talk to a lot of different people at parties.	1	2	3	4	5
4. I don't like to talk a lot.	1	2	3	4	5
5. Keep in the background.	1	2	3	4	5
6. I have little to say.	1	2	3	4	5
7. I am always prepared.	1	2	3	4	5
8. I pay attention to details.	1	2	3	4	5
9. I make a mess of things.	1	2	3	4	5
10. I get chores done right away.	1	2	3	4	5
11. I like order.	1	2	3	4	5
12. I have a vivid imagination.	1	2	3	4	5
13. I am quick to understand things.	1	2	3	4	5
14. I use difficult words.	1	2	3	4	5
15. I spend time reflecting on things.	1	2	3	4	5
16. I am full of ideas.	1	2	3	4	5
17. I feel concern for others.	1	2	3	4	5

18. I am interested in others.	1	2	3	4	5
19. I rarely insult people.	1	2	3	4	5
20. I sympathize with others' feelings.	1	2	3	4	5
21. I am interested in other people's problems.	1	2	3	4	5
22. I take time out for others.	1	2	3	4	5
23. I worry about things.	1	2	3	4	5
24. I get upset easily.	1	2	3	4	5
25. I change my mood a lot.	1	2	3	4	5
26. I have frequent mood swings.	1	2	3	4	5
27. I get irritated easily.	1	2	3	4	5
28. I often feel blue.	1	2	3	4	5

SECTION E – SAFETY PERFORMANCE

Following are questions pertaining to safety performance. Considering only the company where you work please circle the appropriate number on the 5 Likert scale which consists of 1 (Strongly Disagree) 2 (Disagree) 3 (Neutral) 4 (Agree) 5(Strongly Agree). That best describes you response.

		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
1.	I overlook safety procedures in order to get my task done more quickly.	1	2	3	4	5
2.	I follow all safety procedures regardless of the situation I am in.	1	2	3	4	5
3.	I handle all situations as if there is a possibility of having an accident.	1	2	3	4	5
4.	I wear safety equipment required by practice.	1	2	3	4	5
5.	I keep my work area clean.	1	2	3	4	5
6.	I encourage coworkers to be safe.	1	2	3	4	5
7.	I keep my work equipment in safe working condition.	1	2	3	4	5
8.	I take shortcuts to safe working behaviors in order to get the job done faster.	1	2	3	4	5
9.	I do not follow safety rules that I think are unnecessary.	1	2	3	4	5
10.	I report safety problems to my supervisor when I see safety problems.	1	2	3	4	5
11.	I correct safety problems to ensure accidents will not occur.	1	2	3	4	5
12.	I help my co-workers when they are working under risky or hazardous conditions.	1	2	3	4	5
13.	I always point out to the management if any safety related matters are noticed in my company.	1	2	3	4	5
14.	I put extra effort to improve the safety of the workplace.	1	2	3	4	5

15.	I voluntarily carry out tasks or activities that help to improve workplace safety.	1	2	3	4	5
16.	I encourage my co-workers to work safely.	1	2	3	4	5

Thank you so much for your cooperation.

Appendix B

Arabic Questionnaire

التاريخ : 2011

عزيزي المستجيب

أنا طالب دراسات عليا من جامعة أوتارا في ماليزيا، أسعى لاجراء استطلاع اراء العاملين عن أداء السلامه في صناعة النفط والغاز، لتلبية متطلبات الحصول على درجة الدكتوراه في ادارة الاعمال . الهدف من هذه الدراسة هو فهم العلاقة بين ممارسات الإدارة , أساليب القيادة, سمات الشخصية وأداء السلامه.

إنني أدرك قيمة وقتك واعباء العمل الخاص بك . ومع ذلك مشاركتكم في هذا الاستطلاع لايتطلب اكثر من حوالي 10-15 دقيقة من وقتك، وهو أمر حيوي لنجاح هذه الدراسة.

يرجى أن تطمئن إلى أن أجاباتكم سيتم الاحتفاظ بها بسرية تامة، وسوف تبقي هويتك مجهولة. والبيانات التي سوف يمكن تجميعها ستستخدم حصراً لأغراض البحث العلمية فقط .

إذا كنت مهتما في هذه الدراسة او نتائج الدراسة في المستقبل الرجاء الاتصال بي عن طريق البريد الالكتروني wameedh01@yahoo.com أو الاتصال بي على الرقم الهاتف 07801395473.

شكرا لكم مقدما على تعاونكم.

مع خالص التقدير
وميض عبدالزهرة خضير
طالب دكتوارة
كلية الاعمال
جامعة اوتارا / ماليزيا

القسم ا: المعلومات الديموغرافية

الرجاء ملء الفراغ أو وضع علامة (✓) في المربعات المناسبة الذي يطابق الأسئلة أدناه .

1. الوظيفة : --

2. الجنس : ذكر ❒ انثى❒

3. العمر : --------------------------------- سنة

4. المستوى التعليمي :

❒ اعدادية ❒ دبلوم عالي ❒ ماجستير

❒ معهد نفط ❒بكلوريوس ❒ دكتوراه

5. الوضع الاجتماعي : ❒ متزوج ❒ اعزب ❒ ارمل \ مطلق

6. هل تعرضت لاي حادث مهني منذ ان بدءت العمل في هذه الشركة.

❒ نعم ❒ كلا

اذا كانت الاجابة نعم ماهي عدد الحوادث التي تعرضت لها في الشركة ؟

❒ 1- 3 ❒ 4 – 8

❒ 9 – 15 ❒ اكثر من 15

7. منذ متى وانت تعمل في الشركة الحالية ؟______________________________سنة

القسم ب: الممارسات الادارية

فيما يلي الأسئلة المتعلقة بالممارسات الإدارية ، يرجى وضع دائرة حول الرقم المناسب على مقياس ليكرت الخماسي والذي يعبر عن (1) **لا أتفق تماما** ،(2) **لا أتفق**، (3) محايد، (4) اتفق ،(5) اتفق تماما هذه الخيارات تصف اجابتك على الاسئلة الخاصة بشركتك .

الفقرات	لا أتفق تماماً	لا أتفق	محايد	أتفق	أتفق تماماً
1. شركتي تعطيبرنامج تدريبي شامل للعاملين في مجال الصحة والسلامه في مكان العمل .	1	2	3	4	5
2. يتم تدريب المتعينين حديثا بشكل كاف لتعلم قواعد وإجراءات السلامه.	1	2	3	4	5
3. قضية السلامه تعطى اولوية عالية في البرنامج التدريبي.	1	2	3	4	5
4. لم اتلقى تدريباً كافياً للرد على حالات الطوارء في عملي.	1	2	3	4	5
5. الادارة تشجع العمال لحضور برامج التدريب على السلامه.	1	2	3	4	5
6. البرنامج التدريبي في مجال السلامه الذي اعطي لي هو كافي لتمكيني من تقييم المخاطر في مكان العمل.	1	2	3	4	5
7. أعتقد أن الإصابات المرتبطة بالعمل هي نتيجة لعدم وجود مكافآت للإبلاغ عن المخاطر.	1	2	3	4	5
8. اعتقد من المهم ان يكافاء الموظفون عند ابلاغهم عن مخاطر السلامه وتكون المكافاة على شكل (كتاب شكر وتقدير او مبلغ مالي).	1	2	3	4	5
9. يتم تجاهل معاقبة الموظفين لعدم ابلاغهم عن مخاطر السلامه.	1	2	3	4	5
10. تعطى أولوية عالية للسلامه من قبل الإدارة .	1	2	3	4	5
11. قواعد وإجراءات السلامه يتم اتباعها بدقة من قبل الإدارة .	1	2	3	4	5
12. الاجراءات التصحيحية دائماً تؤخذ عندما يتم اخبار الادارة عن الممارسات غير المأمونة.	1	2	3	4	5
13. في مكان عملي المدير او المشرف على العمل لايظهر اهتماماً بسلامة العمال.	1	2	3	4	5
14. تعتبر الادارة اهمية السلامه مساوية لاهمية الانتاج.	1	2	3	4	5
15. أعضاء الإدارة لا يحضرون اجتماعات السلامه.	1	2	3	4	5
16. اشعر ان الادارة مستعدة لتقديم تنازلات بشأن السلامه لزيادة الانتاج.	1	2	3	4	5
17. عندما يتم الابلاغ عن الحوادث الادارة تتصرف بسرعة من اجل حل المشاكل.	1	2	3	4	5
18. شركتي توفر مايكفي من معدات الحماية الشخصية للعمال.	1	2	3	4	5

5	4	3	2	1	19. الشركة التي أعمل بها لا تملك نظام الإبلاغ عن الخطر الذي يمكن الموظفين من توصيل المعلومات عن الخطر قبل وقوع الحوادث.
5	4	3	2	1	20. الادارة تعمل على سياسة الباب المفتوح بشأن قضايا السلامه .
5	4	3	2	1	21. توجد فرص كافية لمناقشة ومعالجة قضايا السلامه في الاجتماعات.
5	4	3	2	1	22. الغايات والاهداف الخاصة باداء السلامه في منظمتي غير واضحة.
5	4	3	2	1	23. هنالك اتصالات مفتوحة حول قضايا السلامه في مكان العمل.
5	4	3	2	1	24. تستند الادارة في تعيين ونقل الموظفيين على سجل السلامه الخاص بكل موظف .
5	4	3	2	1	25. تسعى الادارة للحصول على معلومات لكل مرشح للعمل قبل تعينة تخص اداء السلامه الخاص به.
5	4	3	2	1	26. اعتقد ان اصابات العمل تحدث بسبب توظيف اشخاص ليس لديهم وعي بموضوع السلامه.
5	4	3	2	1	27. الادارة دائما ترحب بأراء الموظفين قبل اتخاذها القرارات النهائية الخاصة بالسلامه في العمل.
5	4	3	2	1	28. شركتي لديها لجان خاصة بالسلامه في العمل تتألف من ممثلين عن الادارة والموظفين .
5	4	3	2	1	29. الادارة تشجع الموطفين للمشاركة في المواضيع المتعلقة بالسلامه.
5	4	3	2	1	30. الادارة تتشاور مع الموطفين بانتظام حول قضية الصحة والسلامه في مكان العمل.
5	4	3	2	1	31. الموظفون لايشاركون باخلاص في تحديد مشاكل السلامه.

القسم ج : اساليب القيادة

فيما يلي الأسئلة المتعلقة أساليب القيادة .   يرجى وضع دائرة حول الرقم المناسب على مقياس ليكرت الخماسي والذي يعبر عن (1) **لا أتفق تماما** ،(2) **لا أتفق** ، (3) محايد ، (4) اتفق ،(5) اتفق تماما هذه الخيرات تصف اجابتك على الاسئلة الخاصة بشركتك .

الفقرات	لا أتفق تماماً	لا أتفق	محايد	أتفق	أتفق تماماً
1. قيادة المنظمة تفتخر بالعاملين .	1	2	3	4	5
2. قيادة المنظمة تشجع على التعلم والتدريب.	1	2	3	4	5
3. قيادة المنظمة تعزز النتائج المعنوية والاخلاقية.	1	2	3	4	5
4. قيادة المنظمة تنظر لاحتياجات وقدرات وتطلعات العاملين.	1	2	3	4	5
5. قيادة المنظمة تستمع الى مخاوف العاملين في العمل.	1	2	3	4	5
6. قيادة المنظمة تشجع على تحسين اداء العاملين .	1	2	3	4	5
7. قيادة المنظمة ترفع من وسائل التحفيز للعاملين.	1	2	3	4	5
8. قيادة المنظمة تشجع على التفكير بشكل خلاق.	1	2	3	4	5
9. قيادة المنظمة تضع معايير صعبة في العمل .	1	2	3	4	5
10. قيادة المنظمة تشجع اعادة التفكير وترد على كافة التسأؤلات.	1	2	3	4	5
11. قيادة المنظمة تجعل التوقعات واضحة بخصوص المستقبل .	1	2	3	4	5
12. قيادة المنظمة تضع خطط وبرامج لمعالجة المشاكل المتكررة.	1	2	3	4	5
13. قيادة المنظمة تضع معايير لتنفيذ العمل.	1	2	3	4	5
14. قيادة المنظمة تشارك العاملين في اتخاذ القرارت .	1	2	3	4	5
15. قيادة المنظمة تضع برامج لمراقبة وتصحيح اداء العاملين.	1	2	3	4	5

القسم د : الشخصية

فيما يلي الأسئلة المتعلقة بالشخصية. يرجى وضع دائرة حول الرقم المناسب على مقياس ليكرت الخماسي والذي يعبر عن (1) **غير دقيقة جداً**،(2) **غير دقيقة** ، (3) معتدلة ، (4) دقيقة ،(5) دقيقة جداً هذه الخيرات تصف اجابتك على الاسئلة .

الفقرات	غير دقيقة جداً	غير دقيقة	معتدلة	دقيقة	دقيقة جداً
1. أشعر بالراحة حول الناس.	1	2	3	4	5
2. أبدأ الحديث مع الناس.	1	2	3	4	5
3. أتحدث إلى الكثير من الناس في مختلف الأطراف.	1	2	3	4	5
4. لا أحب التحدث كثيرا.	1	2	3	4	5
5. أسعى في ان اكون محل انتباه الاخرين.	1	2	3	4	5
6. لدي القليل لقولة.	1	2	3	4	5
7. أنا مستعد دائما.	1	2	3	4	5
8. أنتبه للتفاصيل في عملي .	1	2	3	4	5
9. أكون فوضوي في بعض الاحيان.	1	2	3	4	5
10. أقوم باداء الاعمال على الفور.	1	2	3	4	5
11. أحب النظام في عملي .	1	2	3	4	5
12. لدي تصور واضح عن العمل .	1	2	3	4	5
13. انا سريع في فهم الاشياء .	1	2	3	4	5
14. أستخدم كلمات صعبة عند الحديث مع الاخرين .	1	2	3	4	5
15. أقضي وقتا للتفكير بالعمل .	1	2	3	4	5
16. انا مليئ بالافكار .	1	2	3	4	5
17. أشعر بقلق على الاخرين .	1	2	3	4	5
18. أنا مهتم بالاخرين .	1	2	3	4	5
19. نادرا مااوجه أهانه للاشخاص .	1	2	3	4	5
20. أتعاطف مع مشاعر الاخرين .	1	2	3	4	5
21. انا مهتم في مشاكل الناس .	1	2	3	4	5
22. أخصص وقتا للاخرين .	1	2	3	4	5
23. انا قلق حول العمل .	1	2	3	4	5
24. انا انزعج بسهولة .	1	2	3	4	5
25. انا اغير مزاجي كثيرا .	1	2	3	4	5
26. انا شخص متقلب المزاج .	1	2	3	4	5

27. تثار حفيظتي بسهوله.	1	2	3	4	5
28. اشعر بكثير من الاحيان بالاكتئاب.	1	2	3	4	5

القسم هـ: أداء الأمان:

فيما يلي الأسئلة المتعلقة بأداء الأمان. يرجى وضع دائرة حول الرقم المناسب على مقياس ليكرت الخماسي والذي يعبر عن (1) **لا أتفق تماما**،(2) **لا أتفق** ، (3) محايد ، (4) اتفق ،(5) اتفق تماما هذه الخيرات تصف اجابتك على الاسئلة الخاصة بشركتك .

الفقرات	لا أتفق تماماً	لا أتفق	محايد	أتفق	أتفق تماماً
1. اشرف على اجراءات السلامه لكي انجز مهمتي بسرعة.	1	2	3	4	5
2. اتابع جميع اجراءات السلامه بغض النظر عن حالتي التي انا فيها.	1	2	3	4	5
3. اتعامل مع جميع الحالات كما لو كانت هنالك احتمال وجود حادثة.	1	2	3	4	5
4. ارتدي معدات السلامه التي يتطلبها العمل.	1	2	3	4	5
5. احافظ على نظافة منطقة العمل التي اعمل بها.	1	2	3	4	5
6. أشجع زملائي في العمل لكي يكونو في امان.	1	2	3	4	5
7. أحافظ على معدات عملي في حالة صالحة للعمل دائما.	1	2	3	4	5
8. أتبع طرقاً مختصرة من اجل سلوك عمل امنه لانجاز الاعمال بسرعه.	1	2	3	4	5
9. لاأتبع قواعد السلامه التي اعتقد انها غير ضرورية.	1	2	3	4	5
10. أبلغ عن مشاكل السلامه عندما ارئ مشاكل في عملي.	1	2	3	4	5
11. أصحح مشاكل السلامه لعدم حدوث حوادث .	1	2	3	4	5
12. أساعد زملائي في العمل عندما يعملون تحت ظروف خطرة.	1	2	3	4	5
13. أشير دائما الى الادارة حول اي مسائل متعلقة بالسلامه في شركتي.	1	2	3	4	5
14. أبذل جهداً اظافي لتحسين سلامه موقع العمل.	1	2	3	4	5
15. أتطوع لانجاز المهام او الانشطة التي تساعد على تحسين السلامه في اماكن العمل.	1	2	3	4	5
16. أشجع زملائي في العمل للعمل بسلامه.	1	2	3	4	5

شكراً جزيلاً لتعاونكم

Appendix C: Factor Analysis

1- Factor Analysis for Management Practices and Leadership Styles (IV1, IV2)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.811
Bartlett's Test of Sphericity	Approx. Chi-Square	14622.576
	df	741
	Sig.	.000

Total Variance Explained

Component		Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	5.278	13.534	13.534	5.278	13.534	13.534	4.143	10.624	10.624
	2	4.012	10.288	23.822	4.012	10.288	23.822	3.803	9.750	20.375
	3	3.773	9.675	33.498	3.773	9.675	33.498	3.712	9.517	29.892
	4	3.511	9.002	42.499	3.511	9.002	42.499	3.516	9.014	38.906
	5	3.050	7.821	50.320	3.050	7.821	50.320	3.227	8.274	47.180
dime	6	2.448	6.277	56.597	2.448	6.277	56.597	3.141	8.055	55.235
nsio	7	2.099	5.381	61.978	2.099	5.381	61.978	2.285	5.860	61.095
n0	8	1.576	4.040	66.018	1.576	4.040	66.018	1.920	4.923	66.018
	9	.973	2.495	68.513						
	10	.866	2.220	70.733						
	11	.754	1.934	72.666						
	12	.667	1.711	74.377						
	13	.632	1.622	75.999						

14	.623	1.598	77.596
15	.588	1.507	79.103
16	.533	1.367	80.470
17	.523	1.341	81.811
18	.509	1.304	83.115
19	.496	1.271	84.386
20	.475	1.218	85.603
21	.458	1.175	86.778
22	.445	1.140	87.918
23	.421	1.079	88.997
24	.388	.994	89.991
25	.384	.984	90.975
26	.357	.915	91.891
27	.335	.859	92.750
28	.318	.814	93.564
29	.300	.770	94.334
30	.276	.707	95.041
31	.265	.679	95.720
32	.251	.645	96.365
33	.241	.617	96.982
34	.236	.604	97.586
35	.206	.528	98.114
36	.201	.516	98.630
37	.185	.476	99.105
38	.182	.467	99.572
39	.167	.428	100.000

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component							
	1	2	3	4	5	6	7	8
TR1	.031	.806	-.021	.009	-.006	.045	.022	.000
TR2	-.021	.781	.017	.004	.050	-.002	.009	-.004
TR3	.105	.754	.054	-.080	-.007	-.018	-.034	.006
TR4	-.009	.756	.050	-.030	-.023	-.026	.044	-.025
TR5	-.044	.829	-.028	.007	-.015	.036	.072	.053
TR6	-.021	.819	-.025	.054	.027	.071	.134	.034
RM1	.082	.000	-.022	.050	.018	.134	-.009	.801
RM2	.064	.014	-.020	.022	.055	.136	.061	.756
RM3	.093	.038	.021	.092	-.041	.160	-.052	.755
CM3	-.001	.025	.740	-.027	.076	.048	-.021	.039
CM5	.006	-.056	.747	.015	-.008	.085	.010	.014
CM6	.009	.054	.784	.031	-.048	.081	.026	-.048
CM7	.039	.033	.769	.030	-.043	.058	.075	-.092
CM8	-.017	-.016	.855	-.018	-.003	.015	.069	.040
CM9	-.018	.015	.782	.048	.035	-.110	.019	.022
CF1	.006	.015	.071	.813	-.016	-.020	.006	.109
CF2	-.009	-.051	-.002	.803	.089	.005	.037	-.076
CF3	-.047	-.004	.021	.858	.007	.047	.006	.116
CF4	-.002	.009	-.004	.837	-.003	.089	.032	.060
CF5	-.006	-.012	-.006	.851	.046	.065	.039	-.023
HP1	.042	.110	.000	.073	.016	-.017	.806	.049

HP2	.010	.092	.065	-.004	-.008	-.003	.881	-.027
HP3	-.003	.015	.102	.043	.044	.006	.888	-.022
PE1	.054	.035	.055	.041	.076	.847	.003	.087
PE2	.052	.029	.109	.034	.032	.771	.055	.099
PE3	.108	.042	.043	.011	.062	.861	-.032	.092
PE4	.131	.009	.008	.027	-.036	.618	-.033	.092
PE5	.125	-.015	-.025	.062	-.019	.730	-.002	.083
LDF5	.748	-.011	.012	.025	.025	.070	-.006	.046
LDF6	.821	-.014	.013	-.044	.072	.069	.063	.123
LDF7	.800	.030	-.003	-.020	.159	.123	.014	-.013
LDF8	.849	.015	.011	-.022	.103	.079	.028	.064
LDF9	.871	-.003	.014	-.009	.110	.064	-.036	.069
LDF10	.794	.031	-.025	.003	.095	.125	-.004	.000
LDT1	.093	.047	.045	.053	.753	.035	-.030	.067
LDT2	.170	-.029	-.048	.009	.826	.012	.021	-.049
LDT3	.126	.003	.016	.018	.775	.002	.067	-.007
LDT4	.011	.026	.050	.035	.799	-.001	-.053	.051
LDT5	.115	-.028	-.058	.003	.794	.048	.055	-.029

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

2- Factor Analysis for Personality Traits (M)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.828
Bartlett's Test of Sphericity	Approx. Chi-Square	11436.839
	df	300
	Sig.	.000

Total Variance Explained

Component		Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	4.995	19.979	19.979	4.995	19.979	19.979	4.143	16.573	16.573
	2	4.203	16.811	36.790	4.203	16.811	36.790	3.797	15.189	31.762
	3	2.693	10.770	47.561	2.693	10.770	47.561	3.068	12.270	44.032
	4	2.531	10.125	57.685	2.531	10.125	57.685	3.009	12.034	56.066
	5	2.088	8.353	66.038	2.088	8.353	66.038	2.493	9.972	66.038
	6	.928	3.713	69.751						
dime	7	.840	3.362	73.113						
nsio	8	.775	3.101	76.214						
n0	9	.690	2.759	78.973						
	10	.598	2.392	81.364						
	11	.592	2.368	83.732						
	12	.539	2.155	85.886						
	13	.498	1.992	87.878						
	14	.427	1.709	89.588						
	15	.407	1.630	91.217						

16	.383	1.533	92.750
17	.336	1.343	94.093
18	.286	1.144	95.237
19	.278	1.114	96.350
20	.254	1.017	97.368
21	.214	.858	98.225
22	.180	.720	98.945
23	.152	.610	99.554
24	.075	.301	99.856
25	.036	.144	100.000

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
PET1	.039	-.020	.067	.048	.728
PET2	-.057	-.067	.038	-.022	.588
PET3	-.015	.007	.096	.018	.794
RECOPET5	-.041	.002	-.006	.015	.647
RECOPET6	.005	.165	.024	.146	.715
PCO1	-.024	.065	-.043	.800	-.005
PCO2	.024	.096	-.106	.722	.016
RECOPCO3	.009	.067	.165	.742	.078
PCO4	-.052	.050	.067	.772	.000
PCO5	-.035	.117	.128	.786	.122

PIM1	.078	.880	.140	.120	.015
PIM2	.125	.864	.081	.087	.001
PIM3	.002	.791	.049	.078	-.023
PIM4	-.034	.829	.141	.079	.030
PIM5	-.008	.863	.192	.072	.034
PAG1	.004	.327	.766	.069	.075
PAG2	-.058	.129	.905	.011	.036
PAG3	.006	.117	.892	.104	.046
PAG4	-.036	.060	.827	.016	.093
RECOPEM1	.719	.018	-.091	-.024	.034
RECOPEM2	.743	.030	-.086	-.011	.039
RECOPEM3	.932	.018	.046	.008	-.054
RECOPEM4	.699	.095	.003	-.038	-.012
RECOPEM5	.929	-.021	.031	.001	-.053
RECOPEM6	.902	-.008	.032	-.010	-.082

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

3- Factor Analysis for Safety Performance (DV)

Total Variance Explained

Component		Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
dimension0	1	4.370	54.630	54.630	4.370	54.630	54.630	4.129	51.610	51.610
	2	1.632	20.400	75.030	1.632	20.400	75.030	1.874	23.420	75.030
	3	.602	7.523	82.553						
	4	.395	4.937	87.490						
	5	.310	3.873	91.364						
	6	.285	3.565	94.929						
	7	.248	3.106	98.035						
	8	.157	1.965	100.000						

Extraction Method: Principal Component Analysis.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.829
Bartlett's Test of Sphericity	Approx. Chi-Square	3642.193
	df	28
	Sig.	.000

Rotated Component Matrix[a]

	Component	
	1	2
SA1	.842	.073
SA2	.797	.155
SA3	.860	.092
SA4	.831	.082
SA5	.764	.163
SA9	.860	.098
SB1	.136	.945
SB2	.114	.949

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Appendix D: Reliability Analysis and Descriptive Statistics of Variables

Reliability Analysis

A- Reliability Analysis of the Management Practices

1- Safety training

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.882	6

2- Reward

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.710	3

3- Management commitment

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.872	6

4- Communication and feedback

Case Processing Summary			
		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.891	5

5- Hiring practices

Case Processing Summary			
		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.835	3

6- Employee participation

Case Processing Summary			
		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.825	5

B- Reliability Analysis of the Leadership Styles

1- Transformational leadership

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.907	6

2- Transactional leadership

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.857	5

C- Reliability Analysis of the Personality Traits

1- Extraversion

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.732	5

2- Conscientiousness

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.830	5

3- Intellect

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.911	5

4- Agreeableness

Case Processing Summary

		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.893	4

5- Emotional Stability

Case Processing Summary			
		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.905	6

E- Reliability Analysis of the Safety Performance

1- Compliance with safety behaviour

Case Processing Summary			
		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.912	6

2- Safety participation

Case Processing Summary			
		N	%
Cases	Valid	713	50.7
	Excluded [a]	694	49.3
	Total	1407	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.904	2

Descriptive Statistics of Variables

Statistics									
		TR	RM	CM	CF	HP	PE	LDF	LDT
N	Valid	713	713	713	713	713	713	713	713
	Missing	0	0	0	0	0	0	0	0
Mean		2.8894	3.4278	3.0788	3.3038	3.1702	3.3590	3.2906	3.2715
Std. Deviation		.87292	.80308	.87690	.80455	.93917	.76084	.78124	.73949
Minimum		1.00	2.00	1.00	1.60	1.00	1.80	1.83	1.80
Maximum		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Statistics								
		PET	PCO	PIM	PAG	RECOPEM	SA	SB
N	Valid	713	713	713	713	713	713	713
	Missing	0	0	0	0	0	0	0
Mean		3.4488	2.8957	3.2558	3.2321	3.2712	3.3090	3.5624
Std. Deviation		.69571	.73828	.90893	.92063	.80792	.80990	1.05400
Minimum		1.80	1.00	1.20	1.25	1.67	2.00	1.50
Maximum		5.00	4.60	5.00	5.00	5.00	5.00	5.00

Appendix E: Explore Study Variables Testing the Assumption of Linearity and Normality

1- Safety training

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
TR	713	100.0%	0	.0%	713	100.0%

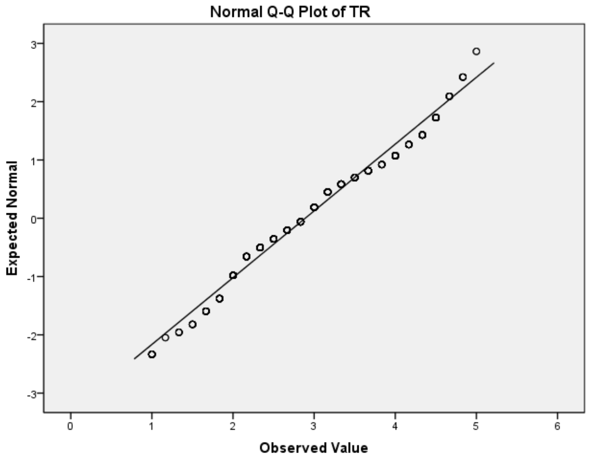
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TR	.098	713	.000	.974	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
TR	Mean		2.8894	.03269
	95% Confidence Interval for Mean	Lower Bound	2.8253	
		Upper Bound	2.9536	
	5% Trimmed Mean		2.8806	
	Median		2.8333	
	Variance		.762	
	Std. Deviation		.87292	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		1.33	
	Skewness		.248	.092
	Kurtosis		-.571	.183



2- Reward

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RM	713	100.0%	0	.0%	713	100.0%

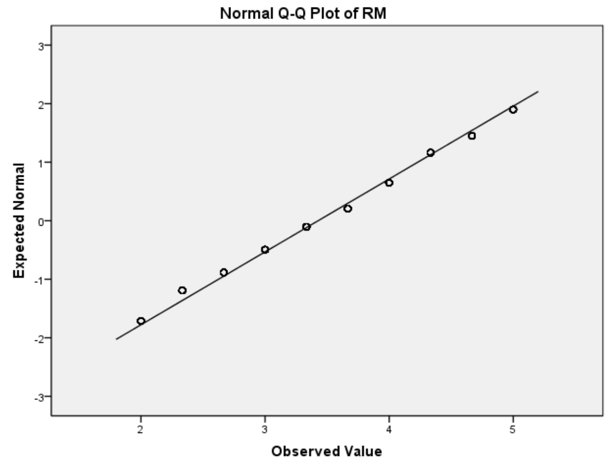
Descriptives

			Statistic	Std. Error
RM	Mean		3.4278	.03008
	95% Confidence Interval for Mean	Lower Bound	3.3687	
		Upper Bound	3.4868	
	5% Trimmed Mean		3.4197	
	Median		3.3333	
	Variance		.645	
	Std. Deviation		.80308	
	Minimum		2.00	
	Maximum		5.00	
	Range		3.00	
	Interquartile Range		1.00	
	Skewness		-.016	.092
	Kurtosis		-.670	.183

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RM	.124	713	.000	.960	713	.000

a. Lilliefors Significance Correction



3- Management commitment

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
CM	713	100.0%	0	.0%	713	100.0%

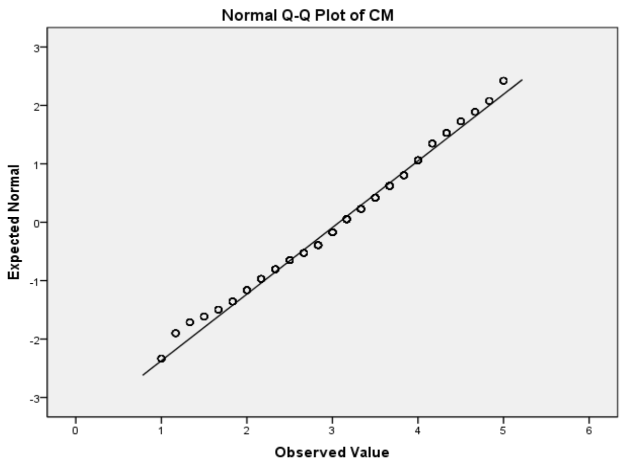
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CM	.088	713	.000	.984	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
CM	Mean		3.0788	.03284
	95% Confidence Interval for Mean	Lower Bound	3.0143	
		Upper Bound	3.1433	
	5% Trimmed Mean		3.0939	
	Median		3.1667	
	Variance		.769	
	Std. Deviation		.87690	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		1.17	
	Skewness		-.271	.092
	Kurtosis		-.295	.183



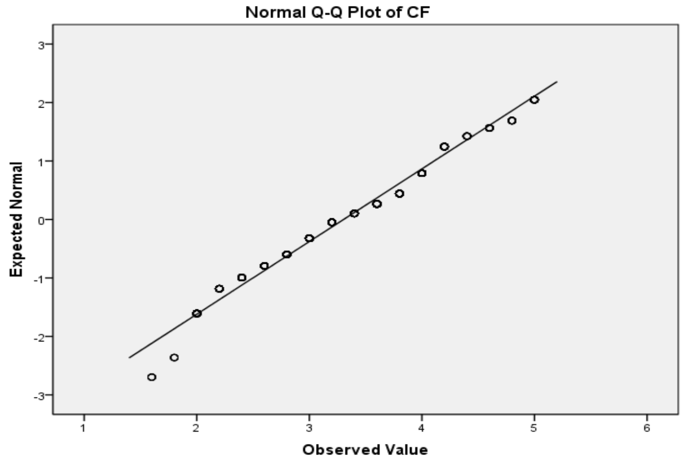
4- Communication and feedback

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
CF	713	100.0%	0	.0%	713	100.0%

Descriptives				
			Statistic	Std. Error
CF	Mean		3.3038	.03013
	95% Confidence Interval for Mean	Lower Bound	3.2446	
		Upper Bound	3.3629	
	5% Trimmed Mean		3.2881	
	Median		3.2000	
	Variance		.647	
	Std. Deviation		.80455	
	Minimum		1.60	
	Maximum		5.00	
	Range		3.40	
	Interquartile Range		1.20	
	Skewness		.056	.092
	Kurtosis		-.702	.183

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CF	.110	713	.000	.967	713	.000

a. Lilliefors Significance Correction



5- Hiring practices

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
HP	713	100.0%	0	.0%	713	100.0%

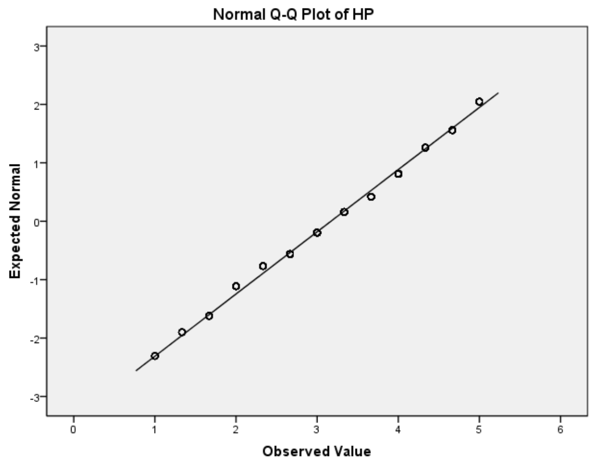
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
HP	.100	713	.000	.972	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
HP	Mean		3.1702	.03517
	95% Confidence Interval for Mean	Lower Bound	3.1011	
		Upper Bound	3.2392	
	5% Trimmed Mean		3.1768	
	Median		3.0000	
	Variance		.882	
	Std. Deviation		.93917	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		1.33	
	Skewness		-.126	.092
	Kurtosis		-.589	.183



6- Employee participation

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
PE	713	100.0%	0	.0%	713	100.0%

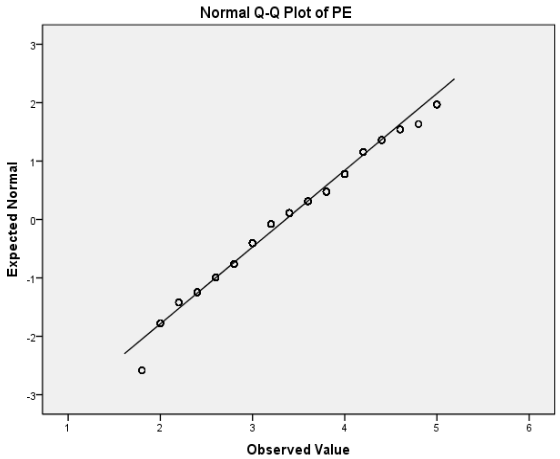
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PE	.118	713	.000	.972	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
PE	Mean		3.3590	.02849
	95% Confidence Interval for Mean	Lower Bound	3.3031	
		Upper Bound	3.4150	
	5% Trimmed Mean		3.3458	
	Median		3.2000	
	Variance		.579	
	Std. Deviation		.76084	
	Minimum		1.80	
	Maximum		5.00	
	Range		3.20	
	Interquartile Range		1.00	
	Skewness		.165	.092
	Kurtosis		-.472	.183



Leadership styles

1- Transformational leadership

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
LDF	713	100.0%	0	.0%	713	100.0%

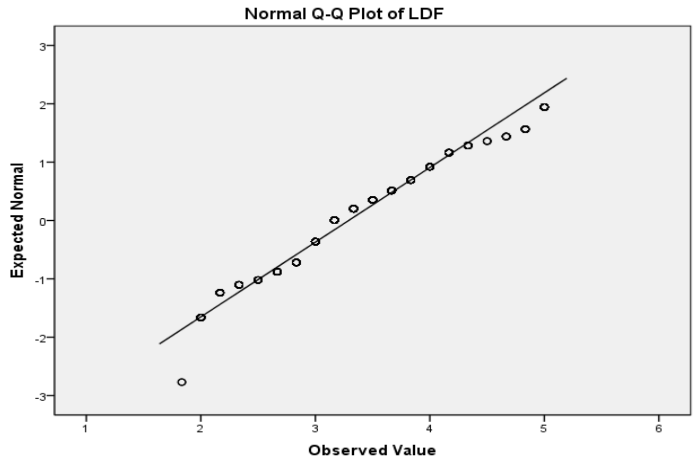
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LDF	.108	713	.000	.959	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
LDF	Mean		3.2906	.02926
	95% Confidence Interval for Mean	Lower Bound	3.2331	
		Upper Bound	3.3480	
	5% Trimmed Mean		3.2681	
	Median		3.1667	
	Variance		.610	
	Std. Deviation		.78124	
	Minimum		1.83	
	Maximum		5.00	
	Range		3.17	
	Interquartile Range		1.00	
	Skewness		.318	.092
	Kurtosis		-.282	.183



2- Transactional leadership

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
LDT	713	100.0%	0	.0%	713	100.0%

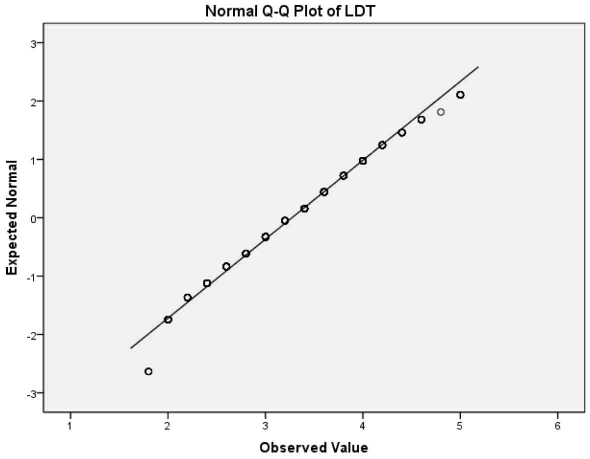
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LDT	.086	713	.000	.978	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
LDT	Mean		3.2715	.02769
	95% Confidence Interval for Mean	Lower Bound	3.2172	
		Upper Bound	3.3259	
	5% Trimmed Mean		3.2547	
	Median		3.2000	
	Variance		.547	
	Std. Deviation		.73949	
	Minimum		1.80	
	Maximum		5.00	
	Range		3.20	
	Interquartile Range		1.00	
	Skewness		.206	.092
	Kurtosis		-.394	.183



Personality Traits

1- Extraversion

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
PET	713	100.0%	0	.0%	713	100.0%

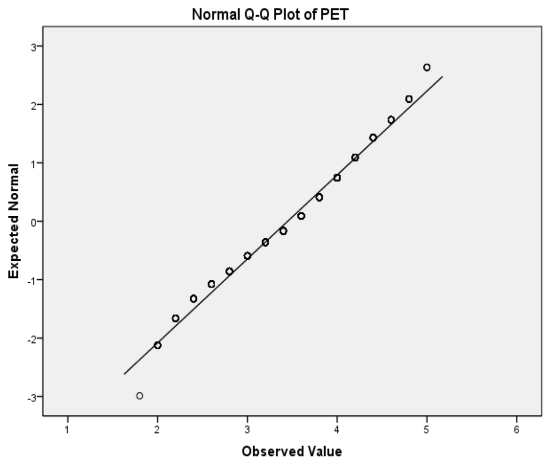
Descriptives

			Statistic	Std. Error
PET	Mean		3.4488	.02605
	95% Confidence Interval for Mean	Lower Bound	3.3977	
		Upper Bound	3.5000	
	5% Trimmed Mean		3.4536	
	Median		3.6000	
	Variance		.484	
	Std. Deviation		.69571	
	Minimum		1.80	
	Maximum		5.00	
	Range		3.20	
	Interquartile Range		1.00	
	Skewness		-.201	.092
	Kurtosis		-.624	.183

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PET	.113	713	.000	.977	713	.000

a. Lilliefors Significance Correction



2- Conscientiousness

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
PCO	713	100.0%	0	.0%	713	100.0%

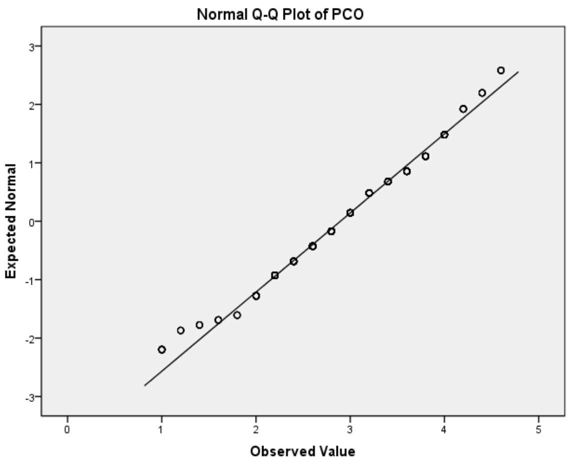
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PCO	.083	713	.000	.978	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
PCO	Mean		2.8957	.02765
	95% Confidence Interval for Mean	Lower Bound	2.8414	
		Upper Bound	2.9499	
	5% Trimmed Mean		2.9148	
	Median		3.0000	
	Variance		.545	
	Std. Deviation		.73828	
	Minimum		1.00	
	Maximum		4.60	
	Range		3.60	
	Interquartile Range		1.00	
	Skewness		-.213	.092
	Kurtosis		-.025	.183



3- Intellect

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
PIM	713	100.0%	0	.0%	713	100.0%

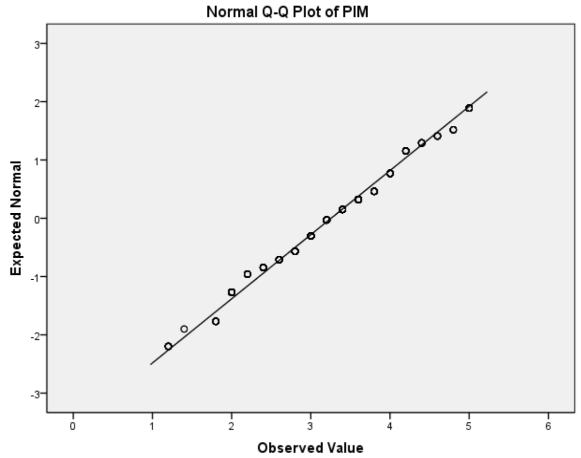
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PIM	.095	713	.000	.972	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
PIM	Mean		3.2558	.03404
	95% Confidence Interval for Mean	Lower Bound	3.1890	
		Upper Bound	3.3227	
	5% Trimmed Mean		3.2580	
	Median		3.2000	
	Variance		.826	
	Std. Deviation		.90893	
	Minimum		1.20	
	Maximum		5.00	
	Range		3.80	
	Interquartile Range		1.40	
	Skewness		-.085	.092
	Kurtosis		-.508	.183



4- Agreeableness

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
PAG	713	100.0%	0	.0%	713	100.0%

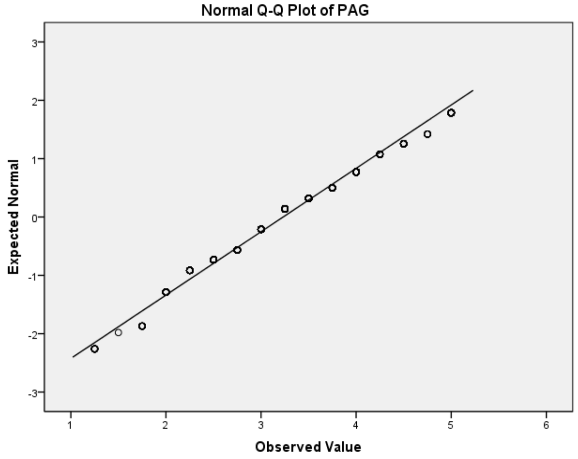
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PAG	.127	713	.000	.965	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
PAG	Mean		3.2321	.03448
	95% Confidence Interval for Mean	Lower Bound	3.1644	
		Upper Bound	3.2998	
	5% Trimmed Mean		3.2253	
	Median		3.0000	
	Variance		.848	
	Std. Deviation		.92063	
	Minimum		1.25	
	Maximum		5.00	
	Range		3.75	
	Interquartile Range		1.50	
	Skewness		.124	.092
	Kurtosis		-.602	.183



5- Emotional stability

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RECOPEM	713	100.0%	0	.0%	713	100.0%

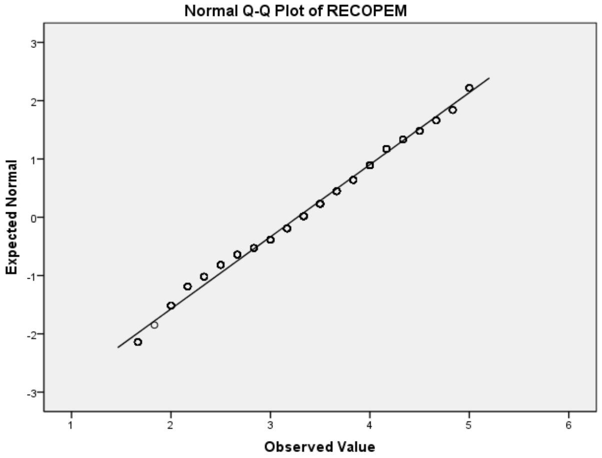
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RECOPEM	.074	713	.000	.979	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
RECOPEM	Mean		3.2712	.03026
	95% Confidence Interval for Mean	Lower Bound	3.2118	
		Upper Bound	3.3306	
	5% Trimmed Mean		3.2640	
	Median		3.3333	
	Variance		.653	
	Std. Deviation		.80792	
	Minimum		1.67	
	Maximum		5.00	
	Range		3.33	
	Interquartile Range		1.17	
	Skewness		-.025	.092
	Kurtosis		-.617	.183



Safety performance

1- Compliance with safety behavior

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SA	713	100.0%	0	.0%	713	100.0%

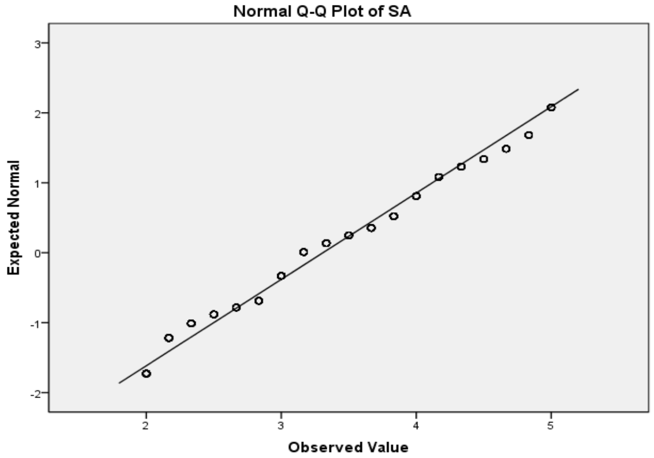
Descriptives

			Statistic	Std. Error
SA	Mean		3.3090	.03033
	95% Confidence Interval for Mean	Lower Bound	3.2495	
		Upper Bound	3.3686	
	5% Trimmed Mean		3.2903	
	Median		3.1667	
	Variance		.656	
	Std. Deviation		.80990	
	Minimum		2.00	
	Maximum		5.00	
	Range		3.00	
	Interquartile Range		1.17	
	Skewness		.182	.092
	Kurtosis		-.699	.183

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SA	.127	713	.000	.959	713	.000

a. Lilliefors Significance Correction



2- Safety Participation

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SB	713	100.0%	0	.0%	713	100.0%

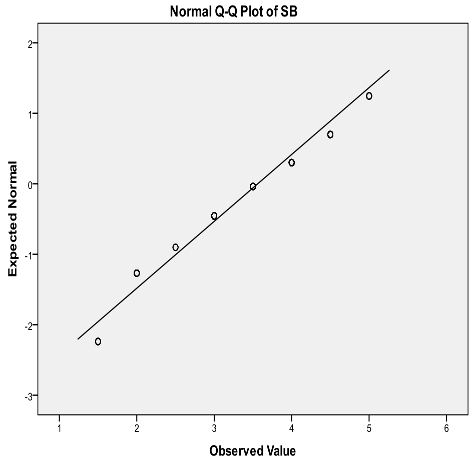
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SB	.165	713	.000	.905	713	.000

a. Lilliefors Significance Correction

Descriptives

			Statistic	Std. Error
SB	Mean		3.5624	.03947
	95% Confidence Interval for Mean	Lower Bound	3.4849	
		Upper Bound	3.6399	
	5% Trimmed Mean		3.5826	
	Median		3.5000	
	Variance		1.111	
	Std. Deviation		1.05400	
	Minimum		1.50	
	Maximum		5.00	
	Range		3.50	
	Interquartile Range		1.50	
	Skewness		-.140	.092
	Kurtosis		-1.086	.183



Tests of Normality

Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.

TR	.098	713	.000	.974	713	.000
RM	.124	713	.000	.960	713	.000
CM	.088	713	.000	.984	713	.000
CF	.110	713	.000	.967	713	.000
HP	.100	713	.000	.972	713	.000
PE	.118	713	.000	.972	713	.000
LDF	.108	713	.000	.959	713	.000
LDT	.086	713	.000	.978	713	.000
PET	.113	713	.000	.977	713	.000
PCO	.083	713	.000	.978	713	.000
PIM	.095	713	.000	.972	713	.000
PAG	.127	713	.000	.965	713	.000
RECOPEM	.074	713	.000	.979	713	.000
SA	.127	713	.000	.959	713	.000
SB	.165	713	.000	.905	713	.000

a. Lilliefors Significance Correction

Appendix F: Multiple Regressions

1. Multiple Regressions Evaluating the Main Effects of Management Practices and Leadership Styles on compliance with safety behaviour (SA).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SA

odel Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.384[a]	.147	.138	.75211	.147	15.202	8	704	.000	1.526

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Dependent Variable: SA

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.793	8	8.599	15.202	.000[a]
	Residual	398.230	704	.566		
	Total	467.023	712			

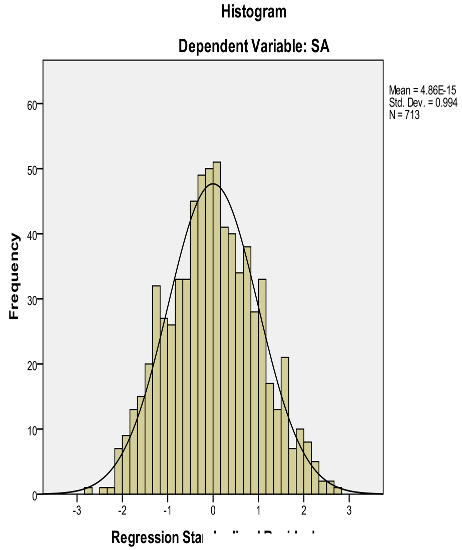
a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

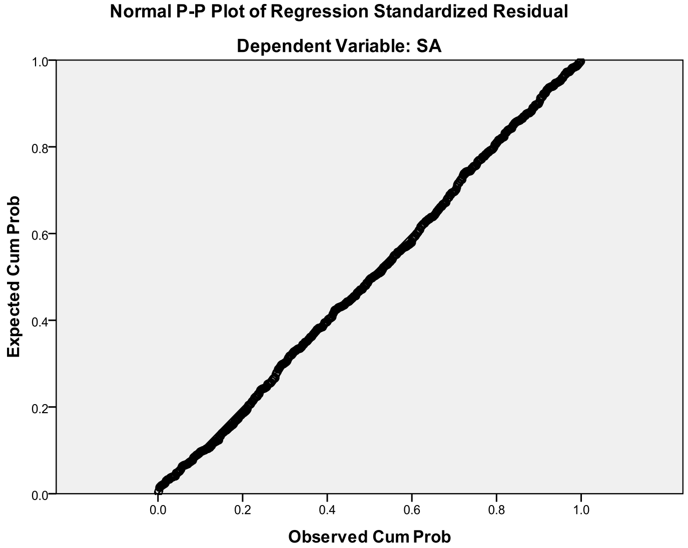
b. Dependent Variable: SA

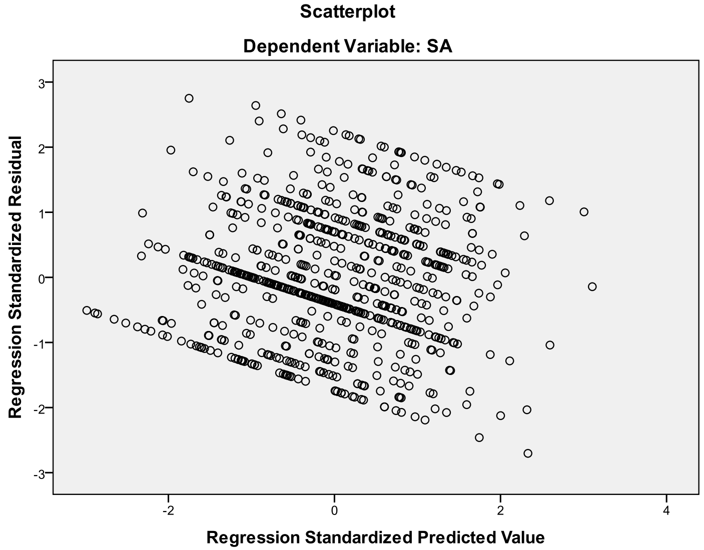
Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.482	.261		1.845	.065		
	TR	.078	.033	.084	2.379	.018	.978	1.023
	RM	.115	.037	.114	3.087	.002	.889	1.125
	CM	.081	.032	.088	2.501	.013	.982	1.019
	CF	.134	.036	.133	3.773	.000	.970	1.031
	HP	.115	.031	.134	3.769	.000	.965	1.036
	PE	.132	.040	.124	3.323	.001	.864	1.157
	LDF	.069	.038	.067	1.803	.072	.879	1.138
	LDT	.146	.039	.133	3.700	.000	.937	1.067

a. Dependent Variable: SA

Charts


Histogram
Dependent Variable: SA
Mean = 4.86E-15
Std. Dev. = 0.994
N = 713
Frequency


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SA
Expected Cum Prob
Observed Cum Prob


Scatterplot
Dependent Variable: SA
Regression Standardized Residual
Regression Standardized Predicted Value

2. Multiple Regressions Evaluating the Main Effects of Management Practices and Leadership Styles on Safety Participation (SB)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SB

Model Summary[b]

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
dimension0	1	.417[a]	.174	.164	.96350	.174	18.504	8	704	.000	1.564

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Dependent Variable: SB

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.425	8	17.178	18.504	.000[a]
	Residual	653.547	704	.928		
	Total	790.973	712			

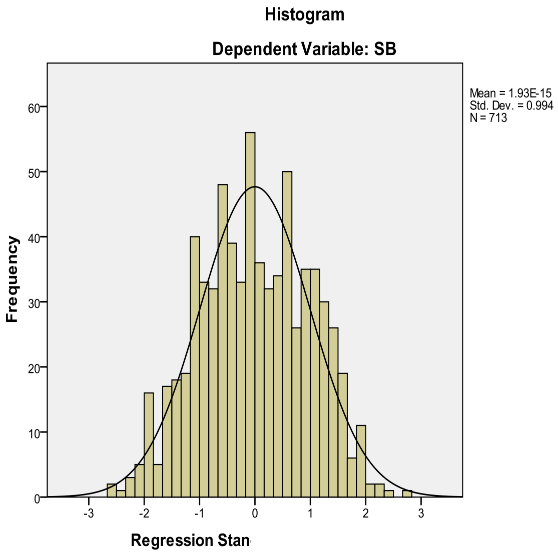
a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

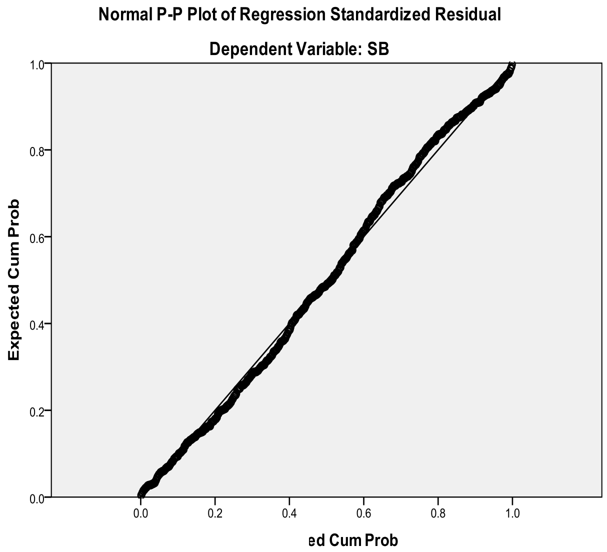
b. Dependent Variable: SB

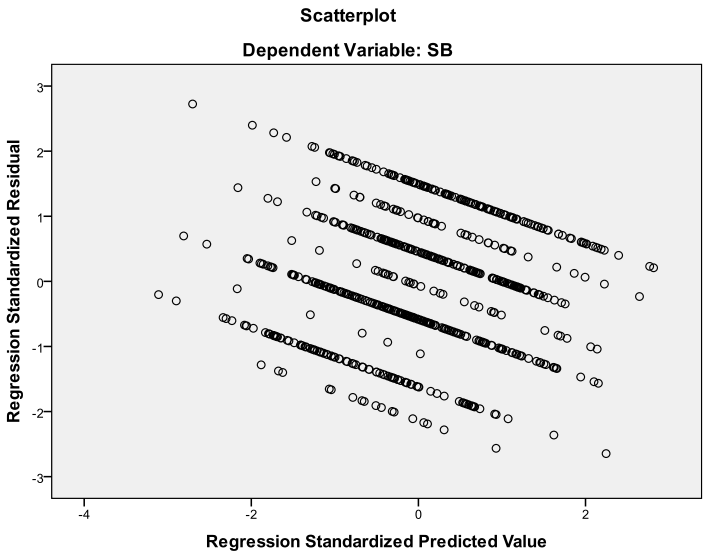
Coefficients[a]								
Model				Standardized				
		Unstandardized Coefficients		Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.367	.335		-1.095	.274		
	TR	.096	.042	.080	2.303	.022	.978	1.023
	RM	.162	.048	.124	3.399	.001	.889	1.125
	CM	.097	.042	.080	2.327	.020	.982	1.019
	CF	.122	.046	.093	2.667	.008	.970	1.031
	HP	.118	.039	.105	3.021	.003	.965	1.036
	PE	.216	.051	.156	4.235	.000	.864	1.157
	LDF	.174	.049	.129	3.520	.000	.879	1.138
	LDT	.221	.050	.155	4.387	.000	.937	1.067

a. Dependent Variable: SB

Charts


Histogram
Dependent Variable: SB
Mean = 1.93E-15
Std. Dev. = 0.994
N = 713
Frequency
Regression Stan


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SB
Expected Cum Prob
ed Cum Prob


Scatterplot
Dependent Variable: SB
Regression Standardized Residual
Regression Standardized Predicted Value

Appendix G: Hierarchical Multiple Regression

1- Hierarchical Multiple Regression Evaluating the Interacting Effect of Personality Traits with Management Practices and Leadership Styles on Compliance with Safety Behaviour.

A- Extraversion

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PET[a]	.	Enter
3	HPPET, CMPET, TRPET, LDFPET, LDTPET, RMPET, CFPET, PEPET[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SA

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.388[a]	.151	.141	.74881	.151	15.601	8	703	.000	
2	.389[b]	.152	.141	.74899	.001	.648	1	702	.421	
3	.428[c]	.183	.163	.73923	.031	3.333	8	694	.001	1.556

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET, HPPET, CMPET, TRPET, LDFPET, LDTPET, RMPET, CFPET, PEPET

Model Summary[d]										
Model					Change Statistics					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.388[a]	.151	.141	.74881	.151	15.601	8	703	.000	
2	.389[b]	.152	.141	.74899	.001	.648	1	702	.421	
3	.428[c]	.183	.163	.73923	.031	3.333	8	694	.001	1.556

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET, HPPET, CMPET, TRPET, LDFPET, LDTPET, RMPET, CFPET, PEPET

d. Dependent Variable: SA

ANOVA[d]					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	69.981	8	8.748	15.601	.000[a]
Residual	394.179	703	.561		
Total	464.160	711			
Regression	70.345	9	7.816	13.933	.000[b]
Residual	393.815	702	.561		
Total	464.160	711			
Regression	84.916	17	4.995	9.141	.000[c]
Residual	379.244	694	.546		
Total	464.160	711			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET, HPPET, CMPET, TRPET, LDFPET, LDTPET, RMPET, CFPET, PEPET

d. Dependent Variable: SA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.454	.261		1.743	.082					
	TR	.077	.033	.083	2.368	.018	.115	.089	.082	.978	1.023
	RM	.120	.037	.119	3.224	.001	.190	.121	.112	.888	1.126
	CM	.078	.032	.084	2.404	.016	.117	.090	.084	.982	1.019
	CF	.142	.036	.141	3.998	.000	.184	.149	.139	.969	1.031
	HP	.120	.030	.139	3.933	.000	.177	.147	.137	.965	1.036
	PE	.121	.040	.114	3.029	.003	.202	.114	.105	.860	1.163
	LDF	.076	.038	.073	1.974	.049	.157	.074	.069	.877	1.140
	LDT	.145	.039	.133	3.708	.000	.179	.139	.129	.937	1.067
2	(Constant)	.348	.292		1.193	.233					
	TR	.077	.033	.083	2.375	.018	.115	.089	.083	.978	1.023
	RM	.118	.037	.117	3.178	.002	.190	.119	.110	.886	1.129
	CM	.079	.032	.086	2.438	.015	.117	.092	.085	.979	1.021
	CF	.140	.036	.139	3.942	.000	.184	.147	.137	.966	1.035
	HP	.121	.031	.140	3.962	.000	.177	.148	.138	.964	1.038
	PE	.120	.040	.112	2.995	.003	.202	.112	.104	.858	1.165

	LDF	.077	.038	.075	2.009	.045	.157	.076	.070	.875	1.142
	LDT	.144	.039	.132	3.668	.000	.179	.137	.128	.935	1.069
	PET	.033	.041	.028	.805	.421	.044	.030	.028	.983	1.017
3	(Constant)	.906	1.344		.674	.500					
	TR	.259	.173	.279	1.492	.136	.115	.057	.051	.034	29.823
	RM	.198	.187	.197	1.058	.290	.190	.040	.036	.034	29.452
	CM	-.592	.170	-.643	-3.485	.001	.117	-.131	-.120	.035	28.884
	CF	.149	.193	.148	.774	.439	.184	.029	.027	.032	31.133
	HP	.479	.150	.556	3.188	.001	.177	.120	.109	.039	25.838
	PE	-.148	.204	-.139	-.728	.467	.202	-.028	-.025	.032	31.163
	LDF	.313	.190	.302	1.648	.100	.157	.062	.057	.035	28.537
	LDT	.032	.187	.029	.169	.866	.179	.006	.006	.040	24.957
	PET	-.121	.389	-.104	-.312	.755	.044	-.012	-.011	.011	95.234
	TRPET	-.051	.048	-.235	-1.059	.290	.106	-.040	-.036	.024	41.765
	RMPET	-.022	.053	-.105	-.417	.677	.161	-.016	-.014	.019	53.467
	CMPET	.189	.047	.872	4.009	.000	.142	.150	.138	.025	40.160
	CFPET	-.001	.055	-.002	-.010	.992	.163	.000	.000	.018	56.034
	HPPET	-.103	.042	-.498	-2.435	.015	.158	-.092	-.084	.028	35.505
	PEPET	.077	.058	.346	1.339	.181	.177	.051	.046	.018	56.540
	LDFPET	-.069	.055	-.298	-1.260	.208	.140	-.048	-.043	.021	47.338
	LDTPET	.030	.055	.129	.553	.581	.156	.021	.019	.022	46.070

a. Dependent Variable: SA

B- Conscientiousness

Variables Entered/Removed[b]			
Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PCO[a]	.	Enter
3	TRPCO, CMPCO, HPPCO, LDTPCO, CFPCO, PEPCO, LDFPCO, RMPCO[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SA

Model Summary[d]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.384[a]	.147	.138	.75211	.147	15.202	8	704	.000	
2	.397[b]	.157	.147	.74814	.010	8.488	1	703	.004	
3	.407[c]	.166	.145	.74870	.008	.869	8	695	.542	1.525

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO, TRPCO, CMPCO, HPPCO, LDTPCO, CFPCO, PEPCO, LDFPCO, RMPCO

d. Dependent Variable: SA

NOVA[d]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.793	8	8.599	15.202	.000[a]
	Residual	398.230	704	.566		
	Total	467.023	712			
2	Regression	73.544	9	8.172	14.599	.000[b]
	Residual	393.479	703	.560		
	Total	467.023	712			
3	Regression	77.442	17	4.555	8.127	.000[c]
	Residual	389.581	695	.561		
	Total	467.023	712			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO, TRPCO, CMPCO, HPPCO, LDTPCO, CFPCO, PEPCO, LDFPCO, RMPCO

d. Dependent Variable: SA

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.482	.261		1.845	.065					
	TR	.078	.033	.084	2.379	.018	.115	.089	.083	.978	1.023
	RM	.115	.037	.114	3.087	.002	.187	.116	.107	.889	1.125
	CM	.081	.032	.088	2.501	.013	.120	.094	.087	.982	1.019
	CF	.134	.036	.133	3.773	.000	.176	.141	.131	.970	1.031

	HP	.115	.031	.134	3.769	.000	.171	.141	.131	.965	1.036
	PE	.132	.040	.124	3.323	.001	.207	.124	.116	.864	1.157
	LDF	.069	.038	.067	1.803	.072	.153	.068	.063	.879	1.138
	LDT	.146	.039	.133	3.700	.000	.177	.138	.129	.937	1.067
2	(Constant)	.231	.274		.841	.401					
	TR	.077	.032	.083	2.368	.018	.115	.089	.082	.978	1.023
	RM	.105	.037	.104	2.821	.005	.187	.106	.098	.882	1.134
	CM	.082	.032	.089	2.548	.011	.120	.096	.088	.981	1.019
	CF	.132	.035	.131	3.738	.000	.176	.140	.129	.970	1.031
	HP	.118	.030	.137	3.875	.000	.171	.145	.134	.964	1.037
	PE	.124	.040	.116	3.108	.002	.207	.116	.108	.859	1.164
	LDF	.059	.038	.057	1.544	.123	.153	.058	.053	.872	1.147
	LDT	.152	.039	.138	3.865	.000	.177	.144	.134	.934	1.070
	PCO	.113	.039	.103	2.913	.004	.137	.109	.101	.963	1.039
3	(Constant)	-.862	1.022		-.843	.399					
	TR	.087	.131	.094	.668	.505	.115	.025	.023	.061	16.509
	RM	.073	.158	.072	.460	.646	.187	.017	.016	.049	20.501
	CM	.036	.132	.039	.276	.783	.120	.010	.010	.059	16.931
	CF	.434	.146	.431	2.967	.003	.176	.112	.103	.057	17.604
	HP	.075	.124	.087	.604	.546	.171	.023	.021	.058	17.120
	PE	.023	.157	.021	.144	.886	.207	.005	.005	.055	18.156
	LDF	.319	.155	.308	2.064	.039	.153	.078	.072	.054	18.550
	LDT	.124	.146	.113	.851	.395	.177	.032	.029	.068	14.777
	PCO	.495	.357	.451	1.388	.166	.137	.053	.048	.011	88.095
	TRPCO	-.003	.044	-.014	-.075	.940	.168	-.003	-.003	.036	27.811

RMPCO	.012	.054	.053	.215	.830	.206	.008	.007	.019	51.462
CMPCO	.014	.044	.059	.323	.747	.173	.012	.011	.036	27.896
CFPCO	-.106	.050	-.453	-2.134	.033	.203	-.081	-.074	.027	37.469
HPPCO	.015	.042	.065	.353	.724	.218	.013	.012	.036	28.038
PEPCO	.035	.053	.153	.656	.512	.219	.025	.023	.022	45.485
LDFPCO	-.089	.051	-.399	-1.738	.083	.177	-.066	-.060	.023	43.833
LDTPCO	.010	.051	.041	.205	.837	.212	.008	.007	.030	33.851

a. Dependent Variable: SA

C- Intellect

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PIM[a]	.	Enter
3	CMPIM, HPPIM, TRPIM, PEPIM, CFPIM, LDFPIM, RMPIM, LDTPIM[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SA

Model Summary[d]

Model					Change Statistics					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson

1	.384[a]	.147	.138	.75211	.147	15.202	8	704	.000	
2	.386[b]	.149	.138	.75190	.002	1.389	1	703	.239	
3	.416[c]	.173	.153	.74526	.024	2.573	8	695	.009	1.541

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM, CMPIM, HPPIM, TRPIM, PEPIM, CFPIM, LDFPIM, RMPIM, LDTPIM

d. Dependent Variable: SA

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.793	8	8.599	15.202	.000[a]
	Residual	398.230	704	.566		
	Total	467.023	712			
2	Regression	69.578	9	7.731	13.674	.000[b]
	Residual	397.445	703	.565		
	Total	467.023	712			
3	Regression	81.009	17	4.765	8.580	.000[c]
	Residual	386.014	695	.555		
	Total	467.023	712			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM, CMPIM, HPPIM, TRPIM, PEPIM, CFPIM, LDFPIM, RMPIM, LDTPIM

d. Dependent Variable: SA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.482	.261		1.845	.065					
	TR	.078	.033	.084	2.379	.018	.115	.089	.083	.978	1.023
	RM	.115	.037	.114	3.087	.002	.187	.116	.107	.889	1.125
	CM	.081	.032	.088	2.501	.013	.120	.094	.087	.982	1.019
	CF	.134	.036	.133	3.773	.000	.176	.141	.131	.970	1.031
	HP	.115	.031	.134	3.769	.000	.171	.141	.131	.965	1.036
	PE	.132	.040	.124	3.323	.001	.207	.124	.116	.864	1.157
	LDF	.069	.038	.067	1.803	.072	.153	.068	.063	.879	1.138
	LDT	.146	.039	.133	3.700	.000	.177	.138	.129	.937	1.067
2	(Constant)	.354	.283		1.249	.212					
	TR	.076	.033	.082	2.322	.021	.115	.087	.081	.976	1.025
	RM	.117	.037	.116	3.143	.002	.187	.118	.109	.887	1.127
	CM	.082	.032	.088	2.517	.012	.120	.094	.088	.981	1.019
	CF	.133	.036	.133	3.753	.000	.176	.140	.131	.970	1.031
	HP	.115	.031	.134	3.780	.000	.171	.141	.132	.965	1.036
	PE	.134	.040	.126	3.367	.001	.207	.126	.117	.863	1.159
	LDF	.071	.039	.069	1.846	.065	.153	.069	.064	.878	1.139
	LDT	.144	.039	.132	3.661	.000	.177	.137	.127	.936	1.068
	PIM	.037	.031	.041	1.179	.239	.028	.044	.041	.989	1.011
3	(Constant)	-.659	.995		-.663	.508					
	TR	.026	.123	.028	.215	.830	.115	.008	.007	.068	14.775

RM	.188	.148	.186	1.269	.205	.187	.048	.044	.055	18.155
CM	-.085	.113	-.092	-.753	.452	.120	-.029	-.026	.079	12.627
CF	.599	.135	.595	4.434	.000	.176	.166	.153	.066	15.157
HP	.191	.109	.222	1.753	.080	.171	.066	.060	.074	13.439
PE	.122	.149	.114	.816	.415	.207	.031	.028	.061	16.520
LDF	.306	.150	.295	2.045	.041	.153	.077	.071	.057	17.540
LDT	-.191	.150	-.174	-1.272	.204	.177	-.048	-.044	.063	15.779
PIM	.336	.295	.377	1.137	.256	.028	.043	.039	.011	92.244
TRPIM	.018	.037	.087	.483	.629	.104	.018	.017	.037	27.241
RMPIM	-.018	.043	-.089	-.414	.679	.140	-.016	-.014	.025	39.270
CMPIM	.050	.034	.244	1.476	.140	.116	.056	.051	.044	22.986
CFPIM	-.141	.040	-.711	-3.534	.000	.113	-.133	-.122	.029	34.027
HPPIM	-.023	.033	-.122	-.706	.481	.141	-.027	-.024	.040	25.035
PEPIM	.001	.044	.005	.023	.982	.146	.001	.001	.027	37.141
LDFPIM	-.074	.044	-.358	-1.663	.097	.115	-.063	-.057	.026	39.048
LDTPIM	.104	.046	.507	2.274	.023	.135	.086	.078	.024	41.848

a. Dependent Variable: SA

D- Agreeableness

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PAG[a]	.	Enter
3	HPPAG, CMPAG, TRPAG, LDFPAG, LDTPAG, RMPAG, CFPAG, PEPAG[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SA

odel Summary[d]

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
dime	1	.391[a]	.153	.144	.74866	.153	15.898	8	703	.000	
nsio	2	.402[b]	.162	.151	.74535	.009	7.258	1	702	.007	
n0	3	.435[c]	.189	.170	.73720	.028	2.951	8	694	.003	1.570

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG, HPPAG, CMPAG, TRPAG, LDFPAG, LDTPAG, RMPAG, CFPAG, PEPAG

d. Dependent Variable: SA

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.286	8	8.911	15.898	.000[a]
	Residual	394.021	703	.560		
	Total	465.307	711			
2	Regression	75.318	9	8.369	15.064	.000[b]
	Residual	389.989	702	.556		

	Total	465.307	711			
3	Regression	88.146	17	5.185	9.541	.000[c]
	Residual	377.161	694	.543		
	Total	465.307	711			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG, HPPAG, CMPAG, TRPAG, LDFPAG, LDTPAG, RMPAG, CFPAG, PEPAG

d. Dependent Variable: SA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.430	.261		1.646	.100					
	TR	.083	.033	.089	2.548	.011	.120	.096	.088	.979	1.021
	RM	.115	.037	.114	3.109	.002	.189	.116	.108	.890	1.124
	CM	.080	.032	.086	2.465	.014	.120	.093	.086	.981	1.019
	CF	.136	.035	.135	3.843	.000	.179	.143	.133	.971	1.030
	HP	.119	.030	.139	3.923	.000	.175	.146	.136	.966	1.035
	PE	.141	.040	.132	3.546	.000	.213	.133	.123	.864	1.157
	LDF	.065	.038	.063	1.697	.090	.152	.064	.059	.878	1.140
	LDT	.149	.039	.136	3.789	.000	.179	.141	.132	.937	1.067
2	(Constant)	.301	.264		1.138	.256					
	TR	.077	.032	.083	2.364	.018	.120	.089	.082	.974	1.026

	RM	.105	.037	.105	2.846	.005	.189	.107	.098	.881	1.135
	CM	.072	.032	.078	2.220	.027	.120	.084	.077	.973	1.028
	CF	.130	.035	.130	3.685	.000	.179	.138	.127	.967	1.034
	HP	.121	.030	.140	3.993	.000	.175	.149	.138	.965	1.036
	PE	.137	.040	.128	3.444	.001	.213	.129	.119	.863	1.159
	LDF	.062	.038	.060	1.616	.106	.152	.061	.056	.877	1.141
	LDT	.141	.039	.129	3.591	.000	.179	.134	.124	.932	1.073
	PAG	.084	.031	.095	2.694	.007	.165	.101	.093	.953	1.049
3	(Constant)	1.005	.939		1.071	.285					
	TR	-.163	.125	-.176	-1.304	.193	.120	-.049	-.045	.064	15.508
	RM	.497	.138	.494	3.603	.000	.189	.135	.123	.062	16.094
	CM	-.035	.116	-.038	-.304	.761	.120	-.012	-.010	.074	13.491
	CF	.208	.139	.207	1.502	.134	.179	.057	.051	.062	16.257
	HP	.026	.106	.030	.248	.804	.175	.009	.008	.078	12.826
	PE	.082	.142	.077	.578	.564	.213	.022	.020	.066	15.256
	LDF	.166	.133	.160	1.251	.211	.152	.047	.043	.071	14.088
	LDT	-.215	.135	-.197	-1.592	.112	.179	-.060	-.054	.076	13.083
	PAG	-.129	.279	-.146	-.462	.644	.165	-.018	-.016	.012	86.023
	TRPAG	.072	.037	.364	1.949	.052	.203	.074	.067	.034	29.825
	RMPAG	-.118	.040	-.647	-2.915	.004	.212	-.110	-.100	.024	42.228
	CMPAG	.032	.035	.163	.911	.363	.202	.035	.031	.036	27.527
	CFPAG	-.024	.041	-.123	-.574	.566	.230	-.022	-.020	.025	39.520
	HPPAG	.028	.032	.149	.880	.379	.250	.033	.030	.041	24.463
	PEPAG	.018	.043	.092	.417	.677	.242	.016	.014	.024	42.063
	LDFPAG	-.037	.040	-.188	-.911	.363	.209	-.035	-.031	.027	36.650

LDTPAG	.112	.042	.564	2.700	.007	.242	.102	.092	.027	37.361

a. Dependent Variable: SA

E- Emotional Stability

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	RECOPEM[a]	.	Enter
3	TRRECOPEM, CMRECOPEM, HPRECOPEM, PERECOPEM, CFRECOPEM, LDFRECOPEM, RMRECOPEM, LDTRECOPEM[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SA

Model Summary[d]

Model					Change Statistics					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.384[a]	.147	.138	.75211	.147	15.202	8	704	.000	
2	.384[b]	.147	.136	.75264	.000	.000	1	703	.988	
3	.402[c]	.161	.141	.75075	.014	1.444	8	695	.175	1.511

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM, TRRECOPEM, CMRECOPEM, HPRECOPEM, PERECOPEM, CFRECOPEM, LDFRECOPEM, RMRECOPEM, LDTRECOPEM

d. Dependent Variable: SA

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.793	8	8.599	15.202	.000[a]
	Residual	398.230	704	.566		
	Total	467.023	712			
2	Regression	68.793	9	7.644	13.493	.000[b]
	Residual	398.230	703	.566		
	Total	467.023	712			
3	Regression	75.303	17	4.430	7.859	.000[c]
	Residual	391.720	695	.564		
	Total	467.023	712			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM, TRRECOPEM, CMRECOPEM, HPRECOPEM, PERECOPEM, CFRECOPEM, LDFRECOPEM, RMRECOPEM, LDTRECOPEM

d. Dependent Variable: SA

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.482	.261		1.845	.065					
	TR	.078	.033	.084	2.379	.018	.115	.089	.083	.978	1.023
	RM	.115	.037	.114	3.087	.002	.187	.116	.107	.889	1.125
	CM	.081	.032	.088	2.501	.013	.120	.094	.087	.982	1.019
	CF	.134	.036	.133	3.773	.000	.176	.141	.131	.970	1.031
	HP	.115	.031	.134	3.769	.000	.171	.141	.131	.965	1.036
	PE	.132	.040	.124	3.323	.001	.207	.124	.116	.864	1.157
	LDF	.069	.038	.067	1.803	.072	.153	.068	.063	.879	1.138
	LDT	.146	.039	.133	3.700	.000	.177	.138	.129	.937	1.067
2	(Constant)	.481	.289		1.661	.097					
	TR	.078	.033	.084	2.377	.018	.115	.089	.083	.977	1.023
	RM	.115	.037	.114	3.083	.002	.187	.115	.107	.888	1.127
	CM	.081	.032	.088	2.499	.013	.120	.094	.087	.981	1.019
	CF	.134	.036	.133	3.769	.000	.176	.141	.131	.969	1.032
	HP	.115	.031	.134	3.759	.000	.171	.140	.131	.961	1.040
	PE	.132	.040	.124	3.321	.001	.207	.124	.116	.864	1.157
	LDF	.069	.039	.067	1.802	.072	.153	.068	.063	.878	1.138
	LDT	.146	.039	.133	3.697	.000	.177	.138	.129	.937	1.067
	RECOPEM	.001	.035	.001	.015	.988	-.010	.001	.001	.992	1.008

3	(Constant)	.724	1.150		.629	.529					
	TR	.096	.129	.103	.741	.459	.115	.028	.026	.062	16.102
	RM	-.015	.158	-.015	-.096	.923	.187	-.004	-.003	.049	20.234
	CM	.192	.129	.208	1.491	.136	.120	.056	.052	.062	16.112
	CF	.497	.148	.493	3.348	.001	.176	.126	.116	.056	17.979
	HP	-.052	.126	-.060	-.413	.680	.171	-.016	-.014	.057	17.605
	PE	-.070	.156	-.066	-.447	.655	.207	-.017	-.016	.056	17.794
	LDF	.082	.159	.080	.517	.605	.153	.020	.018	.051	19.589
	LDT	.071	.167	.064	.421	.674	.177	.016	.015	.052	19.358
	RECOPEM	-.060	.340	-.059	-.175	.861	-.010	-.007	-.006	.011	95.051
	TRRECOPEM	-.006	.039	-.028	-.155	.877	.084	-.006	-.005	.038	26.085
	RMRECOPEM	.041	.048	.188	.855	.393	.131	.032	.030	.025	40.129
	CMRECOPEM	-.037	.038	-.176	-.969	.333	.082	-.037	-.034	.037	27.270
	CFRECOPEM	-.112	.044	-.519	-2.527	.012	.101	-.095	-.088	.029	34.958
	HPRECOPEM	.049	.036	.254	1.349	.178	.127	.051	.047	.034	29.450
	PERECOPEM	.065	.047	.294	1.387	.166	.147	.053	.048	.027	37.233
	LDFRECOPEM	-.006	.049	-.025	-.115	.909	.107	-.004	-.004	.026	38.736
	LDTRECOPEM	.023	.050	.101	.453	.651	.115	.017	.016	.024	41.448

a. Dependent Variable: SA

2- Hierarchical Multiple Regression Evaluating the Interacting Effect of Personality Traits with Management Practices and Leadership Styles on safety participation.

A- Extraversion

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PET[a]	.	Enter
3	HPPET, CMPET, TRPET, LDFPET, LDTPET, RMPET, CFPET, PEPET[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SB

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.417[a]	.174	.164	.96350	.174	18.504	8	704	.000	
2	.421[b]	.178	.167	.96194	.004	3.283	1	703	.070	
3	.440[c]	.194	.174	.95787	.016	1.749	8	695	.084	1.628

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET, HPPET, CMPET, TRPET, LDFPET, LDTPET, RMPET, CFPET, PEPET

d. Dependent Variable: SB

ANOVA[d]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.425	8	17.178	18.504	.000[a]
	Residual	653.547	704	.928		
	Total	790.973	712			
2	Regression	140.463	9	15.607	16.866	.000[b]
	Residual	650.510	703	.925		
	Total	790.973	712			
3	Regression	153.302	17	9.018	9.828	.000[c]
	Residual	637.671	695	.918		
	Total	790.973	712			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PET, HPPET, CMPET, TRPET, LDFPET, LDTPET, RMPET, CFPET, PEPET

d. Dependent Variable: SB

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.367	.335		-1.095	.274					
	TR	.096	.042	.080	2.303	.022	.112	.086	.079	.978	1.023
	RM	.162	.048	.124	3.399	.001	.212	.127	.116	.889	1.125

	CM	.097	.042	.080	2.327	.020	.111	.087	.080	.982	1.019
	CF	.122	.046	.093	2.667	.008	.138	.100	.091	.970	1.031
	HP	.118	.039	.105	3.021	.003	.142	.113	.103	.965	1.036
	PE	.216	.051	.156	4.235	.000	.253	.158	.145	.864	1.157
	LDF	.174	.049	.129	3.520	.000	.229	.131	.121	.879	1.138
	LDT	.221	.050	.155	4.387	.000	.213	.163	.150	.937	1.067
2	(Constant)	-.672	.374		-1.795	.073					
	TR	.097	.042	.080	2.323	.020	.112	.087	.079	.978	1.023
	RM	.158	.048	.120	3.307	.001	.212	.124	.113	.887	1.128
	CM	.100	.042	.083	2.413	.016	.111	.091	.083	.979	1.021
	CF	.116	.046	.089	2.555	.011	.138	.096	.087	.966	1.035
	HP	.121	.039	.108	3.096	.002	.142	.116	.106	.963	1.038
	PE	.213	.051	.154	4.173	.000	.253	.155	.143	.863	1.159
	LDF	.178	.049	.132	3.604	.000	.229	.135	.123	.877	1.140
	LDT	.217	.050	.152	4.309	.000	.213	.160	.147	.935	1.069
	PET	.095	.052	.062	1.812	.070	.078	.068	.062	.983	1.017
3	(Constant)	-.774	1.740		-.445	.656					
	TR	.622	.225	.515	2.768	.006	.112	.104	.094	.034	29.822
	RM	.149	.242	.113	.614	.539	.212	.023	.021	.034	29.419
	CM	.172	.220	.143	.783	.434	.111	.030	.027	.035	28.872
	CF	.395	.249	.301	1.586	.113	.138	.060	.054	.032	31.117
	HP	.006	.194	.006	.032	.975	.142	.001	.001	.039	25.873
	PE	-.322	.263	-.233	-1.226	.221	.253	-.046	-.042	.032	31.050
	LDF	-.114	.245	-.084	-.464	.643	.229	-.018	-.016	.035	28.522
	LDT	.381	.243	.267	1.570	.117	.213	.059	.053	.040	24.962

PET	.131	.503	.086	.260	.795	.078	.010	.009	.011	95.216
TRPET	-.145	.062	-.516	-2.345	.019	.115	-.089	-.080	.024	41.768
RMPET	.003	.068	.011	.044	.965	.204	.002	.001	.019	53.462
CMPET	-.021	.061	-.073	-.337	.736	.134	-.013	-.011	.025	40.114
CFPET	-.079	.071	-.283	-1.108	.268	.143	-.042	-.038	.018	56.020
HPPET	.030	.055	.113	.557	.578	.164	.021	.019	.028	35.570
PEPET	.152	.074	.522	2.044	.041	.242	.077	.070	.018	56.239
LDFPET	.085	.071	.282	1.205	.229	.231	.046	.041	.021	47.367
LDTPET	-.053	.071	-.172	-.743	.458	.201	-.028	-.025	.022	46.099

a. Dependent Variable: SB

B- Conscientiousness

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PCO[a]	.	Enter
3	TRPCO, CMPCO, HPPCO, LDTPCO, CFPCO, PEPCO, LDFPCO, RMPCO[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SB

Model Summary[d]										
Model					Change Statistics					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.420[a]	.176	.167	.96152	.176	18.788	8	703	.000	
2	.430[b]	.185	.174	.95723	.009	7.326	1	702	.007	
3	.457[c]	.209	.190	.94826	.024	2.667	8	694	.007	1.600

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO, TRPCO, CMPCO, HPPCO, LDTPCO, CFPCO, PEPCO, LDFPCO, RMPCO

d. Dependent Variable: SB

ANOVA[d]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	138.960	8	17.370	18.788	.000[a]
	Residual	649.943	703	.925		
	Total	788.903	711			
2	Regression	145.673	9	16.186	17.665	.000[b]
	Residual	643.230	702	.916		
	Total	788.903	711			
3	Regression	164.856	17	9.697	10.784	.000[c]
	Residual	624.048	694	.899		
	Total	788.903	711			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE
b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO
c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PCO, TRPCO, CMPCO, HPPCO, LDTPCO, CFPCO, PEPCO, LDFPCO, RMPCO
d. Dependent Variable: SB

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.404	.335		-1.206	.228					
	TR	.096	.042	.080	2.304	.022	.112	.087	.079	.978	1.023
	RM	.163	.048	.124	3.423	.001	.213	.128	.117	.889	1.125
	CM	.098	.041	.082	2.372	.018	.113	.089	.081	.982	1.019
	CF	.126	.046	.096	2.776	.006	.141	.104	.095	.971	1.030
	HP	.121	.039	.108	3.102	.002	.144	.116	.106	.966	1.036
	PE	.214	.051	.154	4.189	.000	.252	.156	.143	.864	1.158
	LDF	.171	.049	.127	3.475	.001	.228	.130	.119	.879	1.138
	LDT	.227	.050	.159	4.500	.000	.216	.167	.154	.937	1.068
2	(Constant)	-.710	.352		-2.018	.044					
	TR	.095	.042	.079	2.292	.022	.112	.086	.078	.978	1.023
	RM	.151	.048	.115	3.176	.002	.213	.119	.108	.882	1.134
	CM	.100	.041	.083	2.420	.016	.113	.091	.082	.982	1.019
	CF	.125	.045	.095	2.753	.006	.141	.103	.094	.970	1.030
	HP	.125	.039	.111	3.207	.001	.144	.120	.109	.964	1.037

	PE	.203	.051	.146	3.979	.000	.252	.149	.136	.858	1.165
	LDF	.159	.049	.118	3.224	.001	.228	.121	.110	.871	1.148
	LDT	.235	.050	.165	4.669	.000	.216	.174	.159	.934	1.071
	PCO	.135	.050	.094	2.707	.007	.138	.102	.092	.961	1.041
3	(Constant)	-4.127	1.312		-3.146	.002					
	TR	.030	.165	.025	.181	.856	.112	.007	.006	.061	16.521
	RM	.311	.200	.237	1.553	.121	.213	.059	.052	.049	20.516
	CM	.241	.167	.200	1.442	.150	.113	.055	.049	.059	16.953
	CF	.643	.187	.491	3.433	.001	.141	.129	.116	.056	17.922
	HP	.453	.158	.404	2.875	.004	.144	.108	.097	.058	17.305
	PE	-.044	.199	-.032	-.222	.824	.252	-.008	-.008	.055	18.200
	LDF	.039	.196	.029	.200	.842	.228	.008	.007	.054	18.605
	LDT	.565	.187	.397	3.025	.003	.216	.114	.102	.066	15.078
	PCO	1.338	.457	.934	2.928	.004	.138	.110	.099	.011	89.352
	TRPCO	.022	.055	.071	.398	.691	.166	.015	.013	.036	27.727
	RMPCO	-.058	.068	-.206	-.852	.394	.222	-.032	-.029	.020	51.277
	CMPCO	-.048	.055	-.153	-.861	.390	.160	-.033	-.029	.036	27.796
	CFPCO	-.179	.063	-.587	-2.822	.005	.174	-.107	-.095	.026	37.917
	HPPCO	-.111	.053	-.376	-2.098	.036	.181	-.079	-.071	.035	28.188
	PEPCO	.083	.067	.282	1.241	.215	.252	.047	.042	.022	45.392
	LDFPCO	.037	.065	.128	.574	.566	.237	.022	.019	.023	43.770
	LDTPCO	-.115	.065	-.352	-1.783	.075	.229	-.068	-.060	.029	34.265

a. Dependent Variable: SB

C- Intellect

Variables Entered/Removed[b]			
Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PIM[a]	.	Enter
3	CMPIM, HPPIM, TRPIM, PEPIM, CFPIM, LDFPIM, RMPIM, LDTPIM[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SB

Model Summary[d]										
Model					Change Statistics					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.417[a]	.174	.164	.96350	.174	18.504	8	704	.000	
2	.417[b]	.174	.163	.96400	.000	.265	1	703	.607	
3	.436[c]	.190	.170	.96025	.016	1.689	8	695	.098	1.578

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM, CMPIM, HPPIM, TRPIM, PEPIM, CFPIM, LDFPIM, RMPIM, LDTPIM

d. Dependent Variable: SB

ANOVA[d]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.425	8	17.178	18.504	.000[a]
	Residual	653.547	704	.928		
	Total	790.973	712			
2	Regression	137.672	9	15.297	16.461	.000[b]
	Residual	653.301	703	.929		
	Total	790.973	712			
3	Regression	150.128	17	8.831	9.577	.000[c]
	Residual	640.844	695	.922		
	Total	790.973	712			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PIM, CMPIM, HPPIM, TRPIM, PEPIM, CFPIM, LDFPIM, RMPIM, LDTPIM

d. Dependent Variable: SB

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.367	.335		-1.095	.274					
	TR	.096	.042	.080	2.303	.022	.112	.086	.079	.978	1.023
	RM	.162	.048	.124	3.399	.001	.212	.127	.116	.889	1.125
	CM	.097	.042	.080	2.327	.020	.111	.087	.080	.982	1.019

	CF	.122	.046	.093	2.667	.008	.138	.100	.091	.970	1.031
	HP	.118	.039	.105	3.021	.003	.142	.113	.103	.965	1.036
	PE	.216	.051	.156	4.235	.000	.253	.158	.145	.864	1.157
	LDF	.174	.049	.129	3.520	.000	.229	.131	.121	.879	1.138
	LDT	.221	.050	.155	4.387	.000	.213	.163	.150	.937	1.067
2	(Constant)	-.439	.363		-1.209	.227					
	TR	.095	.042	.079	2.275	.023	.112	.085	.078	.976	1.025
	RM	.163	.048	.124	3.419	.001	.212	.128	.117	.887	1.127
	CM	.097	.042	.081	2.332	.020	.111	.088	.080	.981	1.019
	CF	.121	.046	.092	2.657	.008	.138	.100	.091	.970	1.031
	HP	.118	.039	.106	3.024	.003	.142	.113	.104	.965	1.036
	PE	.217	.051	.157	4.249	.000	.253	.158	.146	.863	1.159
	LDF	.174	.049	.129	3.534	.000	.229	.132	.121	.878	1.139
	LDT	.220	.050	.155	4.366	.000	.213	.162	.150	.936	1.068
	PIM	.021	.040	.018	.515	.607	-.001	.019	.018	.989	1.011
3	(Constant)	-3.554	1.282		-2.773	.006					
	TR	.292	.158	.242	1.845	.065	.112	.070	.063	.068	14.775
	RM	.328	.191	.250	1.720	.086	.212	.065	.059	.055	18.155
	CM	.122	.146	.102	.837	.403	.111	.032	.029	.079	12.627
	CF	.633	.174	.483	3.635	.000	.138	.137	.124	.066	15.157
	HP	.212	.140	.189	1.509	.132	.142	.057	.052	.074	13.439
	PE	.219	.192	.158	1.137	.256	.253	.043	.039	.061	16.520
	LDF	.300	.193	.223	1.557	.120	.229	.059	.053	.057	17.540
	LDT	.072	.193	.050	.371	.711	.213	.014	.013	.063	15.779
	PIM	.970	.380	.837	2.551	.011	-.001	.096	.087	.011	92.244

TRPIM	-.059	.048	-.221	-1.239	.216	.070	-.047	-.042	.037	27.241
RMPIM	-.045	.056	-.172	-.805	.421	.131	-.031	-.028	.025	39.270
CMPIM	-.010	.043	-.037	-.223	.823	.078	-.008	-.008	.044	22.986
CFPIM	-.156	.052	-.601	-3.019	.003	.069	-.114	-.103	.029	34.027
HPPIM	-.028	.043	-.111	-.650	.516	.098	-.025	-.022	.040	25.035
PEPIM	-.005	.057	-.017	-.083	.934	.149	-.003	-.003	.027	37.141
LDFPIM	-.039	.057	-.147	-.690	.490	.144	-.026	-.024	.026	39.048
LDTPIM	.045	.059	.167	.758	.449	.128	.029	.026	.024	41.848

a. Dependent Variable: SB

D- Agreeableness

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	PAG[a]	.	Enter
3	HPPAG, CMPAG, TRPAG, LDFPAG, LDTPAG, PEPAG, CFPAG, RMPAG[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SB

Model Summary[d]

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
	1	.417[a]	.174	.164	.96350	.174	18.504	8	704	.000	
dimension0	2	.427[b]	.182	.171	.95940	.008	7.032	1	703	.008	
	3	.468[c]	.219	.200	.94288	.037	4.107	8	695	.000	1.620

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG, HPPAG, CMPAG, TRPAG, LDFPAG, LDTPAG, PEPAG, CFPAG, RMPAG

d. Dependent Variable: SB

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.425	8	17.178	18.504	.000[a]
	Residual	653.547	704	.928		
	Total	790.973	712			
2	Regression	143.898	9	15.989	17.371	.000[b]
	Residual	647.075	703	.920		
	Total	790.973	712			
3	Regression	173.107	17	10.183	11.454	.000[c]
	Residual	617.865	695	.889		
	Total	790.973	712			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE
b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG
c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, PAG, HPPAG, CMPAG, TRPAG, LDFPAG, LDTPAG, PEPAG, CFPAG, RMPAG
d. Dependent Variable: SB

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.367	.335		-1.095	.274					
	TR	.096	.042	.080	2.303	.022	.112	.086	.079	.978	1.023
	RM	.162	.048	.124	3.399	.001	.212	.127	.116	.889	1.125
	CM	.097	.042	.080	2.327	.020	.111	.087	.080	.982	1.019
	CF	.122	.046	.093	2.667	.008	.138	.100	.091	.970	1.031
	HP	.118	.039	.105	3.021	.003	.142	.113	.103	.965	1.036
	PE	.216	.051	.156	4.235	.000	.253	.158	.145	.864	1.157
	LDF	.174	.049	.129	3.520	.000	.229	.131	.121	.879	1.138
	LDT	.221	.050	.155	4.387	.000	.213	.163	.150	.937	1.067
2	(Constant)	-.526	.339		-1.552	.121					
	TR	.088	.042	.073	2.111	.035	.112	.079	.072	.973	1.028
	RM	.150	.048	.114	3.139	.002	.212	.118	.107	.881	1.135
	CM	.087	.042	.072	2.089	.037	.111	.079	.071	.974	1.027
	CF	.114	.045	.087	2.505	.012	.138	.094	.085	.966	1.035

	HP	.120	.039	.107	3.077	.002	.142	.115	.105	.965	1.037
	PE	.210	.051	.151	4.123	.000	.253	.154	.141	.862	1.160
	LDF	.170	.049	.126	3.453	.001	.229	.129	.118	.878	1.139
	LDT	.211	.050	.148	4.188	.000	.213	.156	.143	.931	1.074
	PAG	.106	.040	.093	2.652	.008	.170	.100	.090	.952	1.051
3	(Constant)	-5.467	1.195		-4.575	.000					
	TR	-.006	.159	-.005	-.039	.969	.112	-.001	-.001	.065	15.464
	RM	.535	.177	.407	3.028	.003	.212	.114	.102	.062	16.105
	CM	.364	.148	.303	2.461	.014	.111	.093	.083	.074	13.475
	CF	.523	.177	.399	2.951	.003	.138	.111	.099	.061	16.270
	HP	.091	.134	.081	.678	.498	.142	.026	.023	.078	12.777
	PE	.524	.180	.378	2.903	.004	.253	.109	.097	.066	15.094
	LDF	.565	.169	.419	3.335	.001	.229	.125	.112	.071	14.029
	LDT	.052	.173	.036	.300	.764	.213	.011	.010	.076	13.085
	PAG	1.632	.354	1.425	4.605	.000	.170	.172	.154	.012	85.259
	TRPAG	.028	.047	.111	.608	.543	.187	.023	.020	.033	29.916
	RMPAG	-.115	.052	-.488	-2.235	.026	.225	-.084	-.075	.024	42.461
	CMPAG	-.088	.044	-.349	-1.982	.048	.177	-.075	-.066	.036	27.523
	CFPAG	-.122	.053	-.492	-2.325	.020	.197	-.088	-.078	.025	39.771
	HPPAG	.012	.041	.051	.305	.761	.220	.012	.010	.041	24.516
	PEPAG	-.098	.054	-.392	-1.814	.070	.252	-.069	-.061	.024	41.624
	LDFPAG	-.128	.051	-.504	-2.490	.013	.245	-.094	-.083	.027	36.423
	LDTPAG	.051	.053	.198	.963	.336	.251	.037	.032	.027	37.543

a. Dependent Variable: SB

E- Emotional Stability

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	LDT, CM, TR, RM, CF, HP, LDF, PE[a]	.	Enter
2	RECOPEM[a]	.	Enter
3	TRRECOPEM, CMRECOPEM, HPRECOPEM, PERECOPEM, CFRECOPEM, LDFRECOPEM, RMRECOPEM, LDTRECOPEM[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: SB

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.417[a]	.174	.164	.96350	.174	18.504	8	704	.000	
2	.431[b]	.186	.176	.95701	.012	10.578	1	703	.001	
3	.446[c]	.199	.179	.95502	.013	1.367	8	695	.207	1.601

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM, TRRECOPEM, CMRECOPEM, HPRECOPEM, PERECOPEM, CFRECOPEM, LDFRECOPEM, RMRECOPEM, LDTRECOPEM

d. Dependent Variable: SB

ANOVA[d]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.425	8	17.178	18.504	.000[a]
	Residual	653.547	704	.928		
	Total	790.973	712			
2	Regression	147.113	9	16.346	17.847	.000[b]
	Residual	643.860	703	.916		
	Total	790.973	712			
3	Regression	157.089	17	9.241	10.131	.000[c]
	Residual	633.884	695	.912		
	Total	790.973	712			

a. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE

b. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM

c. Predictors: (Constant), LDT, CM, TR, RM, CF, HP, LDF, PE, RECOPEM, TRRECOPEM, CMRECOPEM, HPRECOPEM, PERECOPEM, CFRECOPEM, LDFRECOPEM, RMRECOPEM, LDTRECOPEM

d. Dependent Variable: SB

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.367	.335		-1.095	.274					
	TR	.096	.042	.080	2.303	.022	.112	.086	.079	.978	1.023
	RM	.162	.048	.124	3.399	.001	.212	.127	.116	.889	1.125

	CM	.097	.042	.080	2.327	.020	.111	.087	.080	.982	1.019
	CF	.122	.046	.093	2.667	.008	.138	.100	.091	.970	1.031
	HP	.118	.039	.105	3.021	.003	.142	.113	.103	.965	1.036
	PE	.216	.051	.156	4.235	.000	.253	.158	.145	.864	1.157
	LDF	.174	.049	.129	3.520	.000	.229	.131	.121	.879	1.138
	LDT	.221	.050	.155	4.387	.000	.213	.163	.150	.937	1.067
2	(Constant)	.143	.368		.390	.697					
	TR	.094	.042	.077	2.251	.025	.112	.085	.077	.977	1.023
	RM	.156	.047	.119	3.284	.001	.212	.123	.112	.888	1.127
	CM	.095	.041	.079	2.304	.021	.111	.087	.078	.981	1.019
	CF	.117	.045	.089	2.588	.010	.138	.097	.088	.969	1.032
	HP	.126	.039	.112	3.231	.001	.142	.121	.110	.961	1.040
	PE	.216	.051	.156	4.252	.000	.253	.158	.145	.864	1.157
	LDF	.170	.049	.126	3.466	.001	.229	.130	.118	.878	1.138
	LDT	.222	.050	.156	4.437	.000	.213	.165	.151	.937	1.067
	RECOPEM	-.145	.045	-.111	-3.252	.001	-.124	-.122	-.111	.992	1.008
3	(Constant)	-.568	1.464		-.388	.698					
	TR	.048	.165	.039	.289	.773	.112	.011	.010	.062	16.102
	RM	.173	.200	.132	.864	.388	.212	.033	.029	.049	20.234
	CM	-.216	.164	-.180	-1.318	.188	.111	-.050	-.045	.062	16.112
	CF	.070	.189	.053	.371	.711	.138	.014	.013	.056	17.979
	HP	.509	.160	.453	3.183	.002	.142	.120	.108	.057	17.605
	PE	.208	.198	.150	1.046	.296	.253	.040	.036	.056	17.794
	LDF	.327	.203	.242	1.613	.107	.229	.061	.055	.051	19.589
	LDT	.292	.213	.205	1.369	.171	.213	.052	.046	.052	19.358

RECOPEM	.081	.432	.062	.188	.851	-.124	.007	.006	.011	95.051
TRRECOPEM	.014	.049	.051	.292	.771	.013	.011	.010	.038	26.085
RMRECOPEM	-.007	.061	-.026	-.119	.905	.057	-.005	-.004	.025	40.129
CMRECOPEM	.095	.049	.346	1.950	.052	.020	.074	.066	.037	27.270
CFRECOPEM	.014	.056	.050	.247	.805	.006	.009	.008	.029	34.958
HPRECOPEM	-.113	.046	-.451	-2.449	.015	.014	-.092	-.083	.034	29.450
PERECOPEM	.001	.059	.002	.009	.993	.084	.000	.000	.027	37.233
LDFRECOPEM	-.049	.062	-.168	-.794	.427	.067	-.030	-.027	.026	38.736
LDTRECOPEM	-.022	.064	-.076	-.346	.729	.050	-.013	-.012	.024	41.448

a. Dependent Variable: SB