

**SAFETY CLIMATE, PROACTIVE PERSONALITY AND SAFETY BEHAVIOUR: A  
STUDY AMONG FUEL STATION ATTENDANTS IN ACCRA.**

BY

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN  
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
M.PHIL IN INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY**

INTEGRI PROCEDAMUS

JULY 2018

**DECLARATION**

This thesis is based on my own research and has not been presented in any other university or this university for any degree or diploma. All references used in this thesis have been acknowledged.

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## **DEDICATION**

I dedicate this work to God Almighty, my mother- Ms Muriel Dove for every sacrifice and my father- Mr Justice Bakidamteh for leading the way.

## ACKNOWLEDGEMENT

I thank God Almighty for the opportunity to pursue further studies, for the wisdom and strength He gave me to go through each day of this journey. My special thanks goes to Mr Nii Okaija Quaye for the unending support throughout my studies. My gratitude goes to Professor Gordon S. K. Adika, Dr George Akanlig-Pare and Miss Nancy Dove for believing in me and supporting me in the course of my studies. My heartfelt gratitude goes to my supervisors, Dr Inusah Abdul-Nasiru and Dr Enoch Teye-Kwadjo for their guidance, corrections and suggestions throughout the writing of this thesis.

I thank Nana Ohene Ntow Adinyira, Ebenezer Petu-Stiles, Courage Kofi, Enoch Randy Aikins, Amma Serwaa Ofori-Amanfo and Nutifafa Dey for every contribution they made towards this thesis. My gratitude also goes to Emmanuel Anokye Nkansah, James Henry Doodoo, Eileen Ama Ackabah, Duke Tetteh, Roberta Kekle Selormey and Sharon Anang for being great friends and motivators throughout the writing of this thesis.

I thank all managers and shift captains who gave me audience in their fuel stations. I would like to express my appreciation to the fuel station attendants who took time to fill my questionnaire. To everyone that contributed to the success of this thesis, "I am grateful".

## ABSTRACT

The downstream oil and gas sector is growing at an increasing rate in Ghana. This growth has come with a cost regarding public safety. Various gas explosions have occurred in Ghana leading to injuries, loss of life, and destruction of properties. However, there is little research investigating this problem. The study investigated the interaction between safety climate perception and safety behaviour among fuel station attendants. A self-report survey was used in collecting data from 206 fuel station attendants. Hierarchical linear regression was used to analyse the data. Results showed that safety climate perception had a positive relationship with safety behaviour. There was a positive relationship between proactive personality and safety behaviour. Proactive personality did not moderate the relationship between safety climate and safety behaviour. Female fuel attendants did not have better safety behaviour than their male colleagues. Fuel station attendants with higher educational level did not have better safety behaviour than fuel station attendants with lower educational level. Findings of the study indicate that managers and supervisors of fuel stations should consider personality profiling of prospective fuel station attendants. Managers must provide better safety equipment and necessary safety strategies in various fuel stations in order to influence the safety climate of fuel station attendants positively.

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## **LIST OF ABBREVIATIONS**

ANOVA: Analysis of Variance Test

ILO: International Labour Organisation

## CHAPTER ONE

### INTRODUCTION

#### **Background**

According to the International Labour Organisation (2017), there are 2,300,000 deaths globally due to the 317,000,000 occupational accidents that are recorded. Poor occupational safety and health practices lead to a loss of about 4 percent of global Gross Domestic Product (ILO, 2017). The World Health Organisation (WHO) and ILO point out that although the rate of occupational accidents is reducing gradually in many industrialised countries, it is increasing in industrialising countries (ILO, 2003a). For every 100,000 workers in Sub-Saharan Africa, the accident rate is 16,000 while the fatality rate is 21. The frequency of work-related accidents shows that forty-two million fifty-four thousand workers die each year as a result of these accidents (Alli, 2008). In comparison, India and China report 10.4 and 10.5 occupational fatality rate respectively per 100,000 workers and 8,700 and 8,028 accidents, respectively (Alli, 2008).

In Ghana, about 2,697 and 1,096 workplace accidents were reported in 2015 and 2016 respectively (Ampofo, 2017). The Labour Department in Ghana, for instance, recorded payment of GH¢6.7 million as workman's compensation to employees in the formal government sector. As at September 2017, the Department recorded an outstanding amount of GH¢5.1 million to be paid to employees who suffered from work-related accidents (Ampofo, 2017). The 2015 Labour Force Report indicates that for every million hours worked, 43 occupational injuries occur in Ghana. It states further that 63 injuries occur per a thousand workers and 418 days are lost due to occupational injuries per million hours worked while 16 days are lost for every occurring injury (Ghana Statistical Service, 2016).

At the individual, organisational, national and global levels, occupational accidents are costly. They result in loss of work hours and production time, compensation and medical expenses (Alli, 2008; Siu, Phillips, & Leung, 2003). Aside from issues related to cost and loss of work hours, the psychological, emotional, and physical trauma borne by employees affected by organisational accidents and their families may be difficult to estimate. It is much disturbing when the employee loses a limb or normal functioning as a result of such accidents and worst when he or she loses his or her life. Major industrial accidents such as Chernobyl (Choudhry, Fang, & Mohamed, 2007), Piper Alpha (Cullen, 1990) and Deepwater Horizon (Safina, 2011) highlight various organisational factors which resulted in their occurrences. For instance, Lord Cullen's investigative report identified the poor safety culture of Occidental, the company which managed the oil rig at the time, as a major cause of the Piper Alpha accident. This has drawn the attention of safety researchers to issues related to or affecting organisational safety climate.

### **Safety Climate and Safety Culture**

Organisational safety climate has been widely studied by researchers. Zohar (1980) stated that it is a “*summary of molar perceptions that employees share about their work environments ... which acts as a frame of reference for guiding appropriate and adaptive task behaviours*” (p.96). By this definition, employees in the same work environment or organisation are likely to develop similar perceptions of the environment, usually based on certain cues they may have observed. These perceptions eventually direct the employees' work behaviour as they adjust themselves to remain in line with acceptable behaviour of the organisation (Guldenmund, 2010; Neale & Griffin, 2006; Zohar, 1980; Zohar, 2010).

Neal and Griffin (2002) also assert that, “*Safety climate, therefore, refers to perceptions of policies, procedures, and practices relating to safety in the workplace*” (p. 69). Through

experience and observation, individuals in an organisation develop molar perceptions in relation to safety in their workplace (Zohar, 1980). The individuals' motivation to work in a safe manner as well as the safe or unsafe behaviour that may be exhibited are determined or regulated by the organisational context (Griffin & Curcuruto, 2016).

Some researchers have used the terms "safety climate" and "safety culture" synonymously (Guldenmund, 2007; Mearns & Flin, 1999; Yule, 2003), owing to the fact that both constructs focus on measuring safety. However, there are clear distinctions between the two constructs. Defined as a set of shared perceptions influenced by individuals' observation of management's commitment and definition of safety (Byrom & Corbridge, 1997; Ostroff, Kinicki, & Tamkins, 2003; Zohar, 1980), safety climate outdoors the safety culture of an organisation, work group or plant (Griffin & Curcuruto, 2016). Safety culture refers to the attitudes, values, perceptions, competencies that influence any organisation's safety and health management (Hale, 2000; HSC, 1993). In other words, safety culture reveals management's attitude towards health and safety issues in an organisation while safety climate is employees' perception of management's attitude towards these issues. While safety climate refers to perceptions, safety culture are values which guide employees' behaviour.

According to Petita, Probst, Barbaranelli, and Ghezzi (2017), a shortfall exists among safety researchers in terms of the measurement of safety climate and safety culture. Researchers have identified safety climate as a multidimensional construct (Griffin & Curcuruto, 2016; Hon & Chan, 2013; Zohar, 2010; Kandola, Curcuruto & Morgan, 2017). Indeed, Kandola et al. (2017) argue that this conceptual approaches have resulted in inconsistencies in the replication of safety research. Safety climate is also measured as a multi-level construct (Griffin & Curcuruto, 2016; Zohar & Luria, 2005). Zohar and Luria (2005) proposed a multilevel model of safety climate. Other studies on safety climate have suggested that differences in group-level climate in various organisations affect outcome criteria such as safety behaviour and service

quality. Zohar and Luria (2005) argue that there are within-group climates resulting from employees developing their own climate perceptions. These perceptions are developed as they observe their supervisors' interpretation, that is, implementation of the organisations' safety procedures.

It is necessary to note that an employee in an organisation has dual roles- as a member of the organisation and a member of a sub-unit within the organisation. Thus, although employees form perceptions of climate based on the stipulated procedures and rules outlined by the organisation or management, their perceptions are equally influenced by their supervisors' interpretation of these procedures. This gives credence to the notion that safety climate influences behaviour through sense-making processes and motivation (Zohar, 2010). This implies that the individual or employee is not merely a passive observer of procedures and rules in the organisation. However, one forms perceptions based on observations and acts (Carr, Schmidt, Ford, & DeShon, 2003). As individuals interact with one another in an organisation, they identify organizational priorities as well as behaviours that are rewarded and those that are punished (Griffin & Curcuruto, 2016). Therefore, as employees relate with their supervisors and other superiors, they are able to identify their priorities and then form their perceptions based on these observations.

Griffin and Curcuruto (2016) argue that considering safety climate at industry and national culture levels is important, especially for organisations operating in high-risk industries. They explain that although several models and measurement tools have been developed, there is a shortfall in creating industry-specific measures of safety climate. This has affected safety management issues in various industries (Mearns & Yule, 2009). They note that while measures for safety management must be developed, "*industry-specific features, managerial orientations and operational safety systems by organisations*" must be interrogated to understand safety climate (Griffin & Curcuruto, 2016, p. 11). Further, they maintain that the

cultural and socio-economic context necessitates safety research in a national setting. Globalisation and industrialisation have pushed multi-national organisations to different countries. This calls for immediate understanding of issues that may influence safety climate in a setting, owing mainly to differences in perception regarding leadership, management and relationships due to the different cultural, social and economic context.

Considering legislation issues existent in different societies, it necessary to question how this affects individuals' perceptions of safety. Different countries have different legislation systems which ultimately affect safety issues such as safety management and compensation. Thus, although the organisation may have its own safety policies in place, these policies are subject to the legislation of a country and may modify or cause changes to be made to some company policies. Knowing that safety climate influences behaviour through sense-making and motivation, understanding the individuals' context may provide clearer understanding of the mechanisms of safety climate-safety behaviour relationship.

### **Safety Behaviour**

Khdair, Shamsudin, and Subramanim (2011) explain that safety behaviour refers to the extent to which an employee will engage in a risky behaviour, obey safety rules, and follow safety procedures. Panuwatwanich, Al-Haadir, and Stewart's (2017) explain that safety behaviour indicates that there are workplace safety and health prerequisites that may help avert occupational accidents. When employees engage in activities that are in line with these requirements, it is identified as safety behaviour. Both explanations suggest that compliance with safety regulations, directives or protocols at work is discretionary.

Neal and Griffin (2000) identified two sub-dimensions of safety behaviour, namely, safety compliance and safety participation. They explain that safety compliance refers to employees' involvement in core safety activities which contribute to workplace safety. Some

of these activities include wearing personal protective equipment, observing safety protocols (Neal & Griffin, 2000; Tucker, 2010). Safety participation describes those activities that do not influence workplace safety directly but may help in creating a safety-friendly workplace environment. These include attending safety meetings, whistleblowing, assisting with safety related issues (Neal & Griffin, 2000; Tucker, 2010). In other words, the latter is much more mandatory for the employee while the former is more voluntary. While safety compliance is associated with those activities that directly affect the individual's safety at work, safety participation contributes to creating a safe workplace for all employees and a safe environment for customers or other members of the environment.

In developing a model for safety climate and safety performance, Neal and Griffin (2000) indicate that safety participation can contribute significantly to the safety of a work group, the work environment, and the organisation. This helps to explain Clarke's (2006) assertion that in comparison to safety compliance, safety participation has a greater effect on minimising the rates of accidents and injuries in organisations over a long period of time. However, safety compliance is equally important. Researchers (Mearns, Whitaker, & Flin, 2001) have indicated that non-compliance, also referred to as safety violations are associated with increased individual and workplace accidents. Shin, Gwak, and Lee (2015) state that "*Safety behaviour is a reliable indicator of safety performance.*"(p. 299). Further, they maintain that about 88% of workplace accidents are directly associated with unsafe behaviours, 10% is attributed to unsafe work environment while 2% is attributed to unrestricting factors. Clearly, safety behaviour influences employees' safety performance.

Although safety climate is a common perception held by employees in the same work environment, risk perception is determined by individual and personality factors (Mueller, DaSilva, Townsend, & Tetrick, 1999). Thus, the individual's interpretation of the situation informs the action one may take. Researchers explain that employees observe and interpret

various contexts with respect to safety in their organisations and later take action based on these interpretations (Schmidt, Ford, & DeShon, 2003). Crant (2000) defined “proactive behaviour” as *“taking initiative in improving current circumstances or creating new ones; it involves challenging the status quo rather than passively adapting to present conditions”* (p. 436). Parker, Bindl, and Strauss (2010) identify proactivity as a *“set of states and psychological conditions”* (as cited in Curcuruto, 2016) which affect the organisation directly or indirectly, for example, organisational climate, job design and individual tendencies; traits, psychosocial resources (Curcuruto, 2016). Proactive behaviour has been defined as a “self-initiated” (Parker, Williams, & Turner, 2006, p.636), “anticipatory” (Grant & Ashford, 2008, p. 13) and future-oriented action (Parker, Williams & Turner, 2006) aimed at causing a change, rather than accepting the status quo (Crant, 2000; Parker, Williams, & Turner, 2006). Proactive behaviour affects the organisation by causing a change in a different direction or by protecting the organisation and ensuring that its processes are not hampered (Conchie, 2013). According to Bateman and Crant (1993), persons with proactive personality cause changes in their environment and are not restrained by the situation.

### **Personality and Safety Behaviour**

Proactive personality has been studied separately from the traditional Big Five personality. Research conducted on proactive personality has focused on career success, counterproductive behaviour and work outcomes such as job satisfaction (Crant, 1995; Prabhu, 2007; Turban, Moake, Wu, & Cheung, 2017; Zhao, Peng & Sheard, 2013). However, there is little information about proactive personality’s influence on safety perception and safety behaviour. Even though many studies identify safety climate as an antecedent to safety behaviour, few studies have focused on personality influences on safety behaviour (Shaheen, et al., 2014). Griffin and Curcuruto (2016) identify safety proactivity as part of safety

participation. Safety proactivity constitutes taking safety initiative (Hofmann, Morgeson, & Gerrass, 2003; Simard & Marchand, 1995), relaying safety-related concerns and suggestions to management (Curcuruto, Guglielmi, & Mariani, 2014, in press; Tucker, Chmiel, Turner, Hershcovis, & Stride, 2008). Thus, it is necessary to investigate how proactive personality will influence the relationship between safety climate and safety performance.

### **Statement of the Problem**

The growing investment in the oil and gas industry in Ghana has led to an increase in the number of fuel stations in the country. Report from the website of the National Petroleum Authority (NPA) indicates that there are 147 registered fuel companies in Ghana. Forty (40) of these companies are Liquefied Petroleum Gas Companies (LPGCs) while 107 are Oil Marketing Companies (OMCs) ([www.npa.gov.gh](http://www.npa.gov.gh)). Various researchers, however, raise concerns about the hazardous nature of fuel service stations because they are viable grounds for fire outbreaks (Afolabi, Olajide & Omotayo, 2011; Cezar-Vaz et al., 2012). Researchers have expressed concerns about little implementation of safety policies by authorities to protect employees and communities from various accidents which may occur as a result of fuel service stations (Afolabi, Olajide & Omotayo, 2011; Monney, Dramani, Aruna, Tenkorang, & Osei-Poku, 2015).

Since 2014, Ghana has recorded about eight gas explosions with serious consequences (Allotey & Clottey, 2017). These explosions occurred in different regions of the country, resulting in the death of about 250 people in the since 2007; whereas other people were maimed or injured by these accidents (Finder, 2017). Clearly, gas explosions and other fuel station accidents have dire consequences for individuals, communities, families, organisations and the country.

Deaths and injuries result in the loss of manpower for organisations and the nation. These accidents may leave employees maimed for life, affecting their well-being and that of their families. It may cause the maimed employee to become a burden to his or her family and society because he or she is no longer able to fend for himself or herself. Properties are damaged and huge losses are recorded by affected organisations, homes and businesses located in the vicinity of these explosions. For instance, damages recorded from five houses and the affected Goil fuel station during the June 3<sup>rd</sup>, 2015 disaster was valued at over \$428,000 (Shaban, 2016).

Also, in times of such accidents, there is huge pressure on healthcare facilities, road systems and other resources. For example, healthcare for victims of the gas explosion at South La, Accra, operated by Louis, depleted stored blood resources of the 37 Military Hospital, and other major hospitals in Accra were choked with disaster victims waiting to receive medical attention after the June 3<sup>rd</sup> disaster (Baneseh, 2017; Kwakofi, 2016). In addition, the Mansco gas explosion at Atomic Junction, Accra on October 7, 2017 caused stampedes on the University of Ghana and Legon Presbyterian Boys' Senior High School campuses because of their closeness to the site. Many students were reported injured in their attempts to flee the fire ball sent from the explosion to these campuses. There was massive traffic on the Legon-Madina road and other parts of Accra.

The growth of the oil and gas industry has not been met with an increase in health and safety research in the industry. There is very little information on health and safety research in the oil and gas industry in Ghana. Studies in the industry such as those by Gyimah-Boadi and Prempeh (2012) and by Sakyi, Efavi, Atta-Peters, and Asare (2012) focused on environmental and socio-economic impacts of the industry. In the wake of various accidents and explosions recorded at fuel service stations across Ghana such as the June 3 disaster which occurred at Kwame Nkrumah Circle on June 3, 2014 and the Mansco gas explosion recorded at Atomic

junction on October 7, 2017, there have been several calls on the government, Environmental Protection Agency (EPA), National Petroleum Authority (NPA), and other stakeholders to take steps in implementing more stringent safety measures to regulate the activities of fuel stations across the country.

This study was, therefore, motivated by the calls for more safety research into the oil and gas industry. Knowing the important role of employees in an organisation's processes (Boudreau & Ramstad, 2007), this study examined the shared perception of safety among fuel station attendants and the impact this perception has on their safety behaviour.

### **Research Aims and Objectives**

The main aim of the study was to examine the relationship between safety climate and safety behaviour. The objectives were to;

- a) Examine the relationship between proactive personality and safety behaviour.
- b) Identify whether proactive personality has an influence on the relationship between safety climate and safety behaviour.
- c) Determine if there are any differences in safety behaviour of males and females.
- d) Identify whether level of education affects safety behaviour of fuel station attendants.

### **Relevance of the Study**

Findings of the study will add to knowledge in safety research. The study may serve as a point of reference for future studies in the field of safety research, especially in the Ghanaian and African contexts. Since there is a dearth of information in safety research, especially in the oil and gas sector in Ghana and Africa, the study may be a meaningful guide to future studies in the field. Hence, broadening existing knowledge. Without human capital, any organisation may not function to its fullest capacity or even cease to function. This implies that employees

are the most important resource to any organisation. Employee safety and well-being must be of utmost importance to the organisation. This study will provide insight to the fields of organisational as well as occupational health psychology. The study will highlight the need for better safety culture to be developed by managers, supervisors, directors and other stakeholders in the oil and gas industry, particularly the downstream sector such as fuel service stations. Knowing safety culture to influence safety climate (Cox & Flin, 1998), this will be a major step towards positive safety management.

Also, the study will educate managers, fuel attendants, lube bay mechanics, lube bay attendants and fuel tanker drivers and employers on the influence of personality on workplace safety. Although various industries such as banking sector undertake some form of personality profiling prior to or after employment, this is not the case in downstream oil sector. The current study will highlight the importance of personality variables and its influence on operations in the sector. This may cause managers of fuel stations to consider incorporating personality profiling in selection processes of new employees.

Lastly, the study will provide further understanding of the situation in Ghana in the area of workplace safety. This study will reveal perceptions of fuel attendants with regards to the safety of their organisation. This will inform stakeholders of the real issues on the ground concerning safety at fuel stations, rather than waiting for accidents to occur and perform post mortem of the accident. It will provide reliable information which can be considered in the development of new policies for the progress of the oil and gas sector and the protection of individuals as well as communities in the country.

## CHAPTER TWO

### REVIEW OF LITERATURE

#### Theoretical Framework

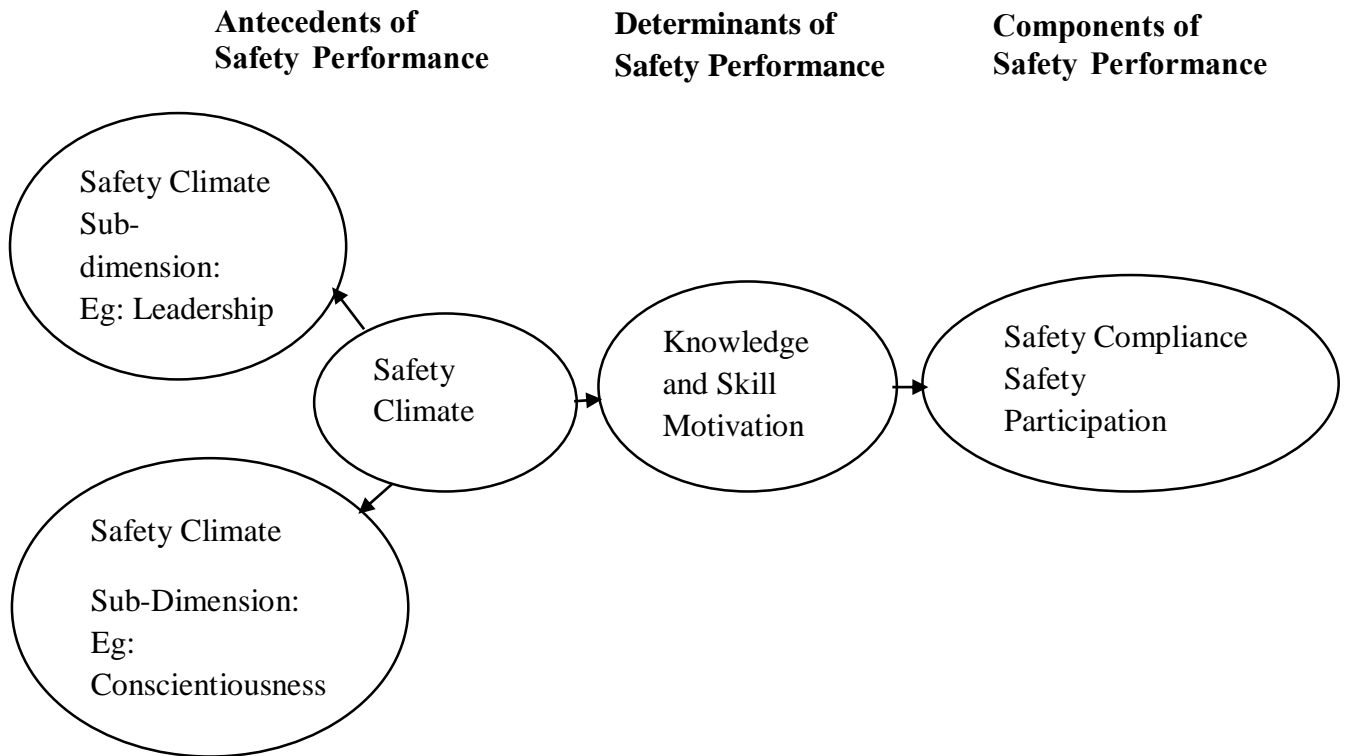
This study has been conceptualised grounded on Neal and Griffin's (2002) model of workplace safety. Griffin and Neal (2000) assert that safety-related work behaviour can be conceptualised as other work-related behaviours associated with performance. Thus, it is possible to employ models of performance to the interpretation of safety performance at work. The model developed by Neal and Griffin (2002) identifies components of safety performance, determinants of safety performance and antecedents of safety performance. The model helps to explain and identify the relationship between components of safety performance, determinants of safety performance and antecedents of safety performance.

According to the model, safety climate is an antecedent of safety behaviour. The components of safety performance are behaviours individuals engage in at work. Based on the work of Borman and Motowidlo (1993), they describe two types of safety behaviour, that is, safety compliance and safety participation. Safety compliance refers to mandatory safety activities employees engage in at work. Safety participation refers to voluntary activities employees may partake in which contributes positively to workplace safety.

Neal and Griffin (2002) also described determinants of safety performance as knowledge, skill and motivation. These determinants explain the differences in peoples' behaviour, especially in performance. Thus, antecedents of safety performance exert influence on individuals' behaviour by affecting knowledge, skills and motivation. Neal and Griffin (1999) assert that individual factors such as ability and personality and environmental factors such as organisational climate also affect individuals' work behaviour. Based on the model by Neal and Griffin (2000), this study will investigate the relationship between safety climate and

safety behaviour, while considering the moderating role of proactive personality in the relationship. This theoretical model is illustrated in Figure 1.

**Workplace Safety Model**



**Figure 1: Relationship among Antecedents, Determinants and Components of Safety Performance**

In the current study, safety climate perception is an antecedent of safety performance and has an influence on the components of safety performance (in this case, safety behaviour). Proactive personality according to the model is an antecedent of safety performance. However, it is investigated as a moderator in the study. As a characteristic of individuals, it is proposed that proactive personality will influence the strength of the relationship between safety climate and safety performance in the study, following Judd (2001).

Although the Workplace Safety Model provides the background to understand safety performance, it does not provide much information on the factors or mechanisms responsible for workplace accidents and injury. Again, the theory does not seem make clear distinctions

between person-related and situation-related factors which have effects on safety performance within an organisation. Thus, there may be unanswered questions about other factors which may be distal-related to safety performance at work. This limitation requires that further research be carried on organisational safety.

## **Review of Related Studies**

### **Safety Climate and Safety Behaviour**

Many studies have focused on conceptualising safety climate and examining the differences that exist between safety climate and safety culture. Few studies have focused on exploring how safety climate exerts influence on safety behaviour and other related constructs (Neal & Griffin, 2002). Studies focused on interrogating safety climate and safety behaviour have identified different relationships between safety climate and safety performance. For instance, studies by Siu, Phillips, and Leung (2003) reported a partial relationship between safety climate and safety performance. Siu et al. (2003) indicated that while safety attitudes predicted occupational injuries, communication and accident rates or injuries did not have a significant relationship. Safety attitudes did not also determine accident rates though they predicted injury. The result showed that accidents are mainly caused by employees' unwillingness to comply with safety rules and procedures. Communication, however, predicted neither accident rates nor injuries. Thus, the relationship between safety climate and safety performance per their study was a partial one.

Siu et al.'s (2003) findings may have been as a result of communication being measured as a general organisational climate and not a specific construct. Safety climate was measured using the Safety Attitude Questionnaire and safety performance was measured using self-reported measures of accident involvement (Siu et al., 2003). The safety climate measure focused on safety attitudes of the employee, their supervisors, their colleagues, management,

and safety officers and communication within the organisation. This implies that the study focused on only two sub-dimensions of safety climate. This may have affected the results of the study because the two sub-dimensions that were measured may not necessarily be significant in the context of the organisation.

Shaheen et al. (2014) did not find a relationship between safety climate and safety performance. They explained that their prediction of a positive relationship between safety climate and safety performance was rejected because little attention is paid to safety and safety issues in the textile industry of Pakistan. They asserted that management in the textile industry did not give much attention to safety issues so employees may not have necessarily regarded safety as a crucial part of their activities. Thus, the negative relationship between the two constructs.

In contrast, Sadullah and Kantan (2009) found positive relationships between four factors of safety climate; absence of work pressures, maintenance and spares, safety and personal protective equipment use training and safety behaviours. However, there was a negative relationship between communication, an aspect of safety climate and safety behaviour. They explained that this negative relationship may be as a result of poor communication practices and ineffective communication systems in the organisation. That is, employees seemed to have a negative perception of communication of safety issues in their organisation. The study, although the first of its kind in Turkey, was conducted in a private Turkish shipyard. Thus, the findings may not be generalised easily.

Another study by Wu, Chen, and Li (2008) suggested that safety climate had a positive relationship with safety performance. They investigated the relationship between safety leadership, safety climate and safety performance, using samples from four universities in Central Taiwan. Safety leadership influenced safety performance indirectly and safety climate had a direct influence on safety performance. They indicated that the managers determine

whether safety equipment, safety measures and accident investigations are considered in maintaining and improving on safety in an organisation. This eventually influences safety performance of employees.

Wu et al. (2008) explained that the decision of leaders of organisations ultimately affects safety climate. They also indicated that the reverse is true, especially in organisations where there may be other leaders such as board of directors superior to managers and chief executive officers (CEOs) as in the case of the universities included in their study. They suggested that in such organisations, managers may have little or no control over safety climate. However, managers' continuous commitment towards safety in the organisation will affect safety management significantly and subsequently, employees' safety performance. The study established a model for safety climate, safety leadership and safety performance using path analysis.

Using structural equation modelling, Shin et al. (2015) found that safety climate had a relationship with safety behaviour among 397 construction workers in South Korea. They found that safety climate, safety motivation, safety knowledge, stress response and organizational commitment influenced safety behaviour. They also identified safety climate as a multi-dimensional construct, with its sub-dimensions being management values, immediate supervisor, organizational safety practices such as communication and safety training. They defined safety behaviour as safety participation and safety compliance. Per the outcome of their study, a relationship existed between safety climate and safety behaviour. However, management values and immediate supervisor did not influence safety behaviour directly. Communication and training influenced safety participation and safety compliance, separately. In addition, management values and indirect supervisor influenced safety behaviour indirectly through affective commitment, safety motivation and safety knowledge. They reported that among the intervening variables, safety knowledge had the most direct effect on safety

behaviour. This implies that management values which indicate management's interest and commitment to employee welfare, health and safety issues and the attitude of immediate supervisors towards safety issues affected safety knowledge of employees. Safety knowledge then influenced safety behaviour. They noted that to improve on safety behaviour of construction workers, management should organize safety training and engage them in discussions concerning the safety of construction sites. The study focused on construction workers who are often engaged on sub-contract basis. Therefore some findings may not be easily generalised to permanent employees. Often, contract staff are employed to provide their services for a period of time. In some organisations, contract and permanent staff receive different treatments. Thus, it is likely the attitude of contract staff towards safety issues may differ from that of permanent staff.

Panuwatwanich et al. (2017) reported that safety climate has a direct influence on safety behaviour. The study was conducted among 295 project managers, engineers and supervisors of construction companies in Saudi Arabia. Their study supported the findings of researchers (Wu et al., 2008) which identify a positive relationship between safety climate and safety behaviour. Although safety motivation did not influence safety behaviour directly, safety climate mediated the relationship between the two constructs. Hence, safety behaviour would not be changed or reinforced by safety motivation alone. Management must consider the kind of safety climate in place in their organisations in order to change employees' safety behaviour. This does not suggest that safety motivation must be ignored. Rather, programmes and systems that will create safety motivation must be inculcated by managers. Such programmes will cause employees to contribute to creating a safe work environment. Focused on top level employees of construction companies, the study may not have provided the true picture of safety in these organisations. Managers and supervisors are in direct contact with the board of directors, chief executive officers and other higher-ranking decision makers of the organisation. Hence, their

view of safety will differ from that of other employees who do not have direct contact with higher management (Wu et al., 2008). Comparing managers, supervisors and engineers' perception of safety to that of other employees would have helped in depicting a more representative picture.

Mearns, Whitaker, and Flin (2003) asserted that employees' perception of organisation's safety was not influenced by their involvement in workplace accidents. They expected safety climate scores to predict self-reported accidents. Similar to the findings of Siu et al. (2004), they found a partial relationship between safety climate and safety performance, using longitudinal data collected in two years among employees of thirteen offshore oil and gas installations in the United Kingdom. Safety performance was measured mainly through self-reported accidents. Communication had a significant relationship with the rate of grievous incidents. Communication was highly correlated with the accidents reported. The authors explained that communication is instrumental in organisational learning linked to safety investigations, change in safety protocols and safety incident investigations in organisations.

In the Ghanaian context, few studies on safety climate-safety behaviour relationship have been conducted in the mining industry (Froko, Asumeng & Nyarko, 2015; Adutwum, 2010), oil and gas industry (upstream oil sector or oil fields) (Bayire, 2015; Horbah, Pathirage, & Kulatunga, 2017) and healthcare sector (Ameko; 2015). Froko et al. (2015) reported a positive relationship between employees' perception of safety climate and their safety related behaviours among employees of mining firms in Ghana. This supports earlier findings by Adutwum (2010). Per his results, safety climate predicted safety behaviour (defined as safety compliance and safety initiative in his study) among 273 mine workers. Bayire (2015) and Horbah et al. (2017) indicated that safety climate influences risk in the oil and gas industry. Bayire (2015) asserted that employees who have high perception of safety climate engaged in

less risky behaviour while Horbah et al. (2017) maintained that “*safety climate measures were predictive indicators for major accident risks in the oil and gas industry*” (p. 539).

These studies report varying relationships among the sub-dimensions of safety climate and safety behaviour. For instance, the findings of Bayire (2015) suggested a positive relationship between employee risk behaviour and pressure for production but a negative relationship existed between co-worker value for safety, management commitment, communication, and priority of safety and employee risk behaviour. This implies that a work environment which places high demands on employees for high production makes employees more prone to engaging in unsafe behaviours. The results of the study may have been influenced by participants’ desire to appear as more ethical to the researcher than they may really be.

Froko et al. (2015) found that supervisory practices explained differences in safety performance among employees better than did other sub-dimensions of safety climate; safety training, communication, management value and safety systems. Their results also indicated that safety communication influenced safety performance significantly. They explained that when employees consider safety information received to be ample and relevant, they were more likely to do their work safely by following safety protocols and regulations. However, safety communication did not influence safety participation. Safety systems was directly related to safety compliance and safety participation. They attributed this to the existence of regulatory systems in mining organisations that ensure employees’ compliance with safety rules and regulations. Thus, these systems encourage and reinforce safety performance.

Froko et al. (2015) asserted that the inability of management value for safety to influence safety performance, that is, safety participation and safety compliance may be due to management’s indirect relations with employees. Management is mainly involved in decision-making and policy making. However, it is supervisors and other superiors who directly exercise

authority by ensuring subordinates' adherence to rules and regulations. Hence, management is not necessarily influential in changing or reinforcing employees' safety performance directly. The study did not explore employees' accident involvement. Considering the high-risk nature of the mining industry, it is likely that accident involvement may influence employees' perception of safety. Again, linking demographics to the variables may have assisted in explaining the various relationships observed in the study.

Similarly, Adutwum (2010) found that supervisor monitoring is strongly related to safety initiatives while co-worker value for safety predicts employees' compliance. Supervisor monitoring and safety communication were predictive of safety initiatives while supervisor monitoring and co-worker safety significantly predicted fatalism, safety compliance and risk perception. Risk perception also predicted employees' likelihood to take safety initiatives.

Horbah, et al. (2017), on the other hand, found that safety priority, supportive environment, management of change, supervision, management commitment, change management and equipment maintenance have strong influence on accident risks in the upstream oil and gas sector of Ghana. However, the study failed to identify antecedents of the various risk indicators identified.

### **Safety Climate, Safety Behaviour and Demographic Characteristics**

Researchers have studied the influence of demographic characteristics on safety climate and safety behaviour. This is necessary as it may assist in explaining variances in employees' safety perception or safety behaviour (Burke, Sarpy, Tesluk, & Smith-Crowe, 2002). Indeed, Tucker (2010) posits that individual characteristics such as personality and gender affect occupational safety and stress. Further understanding in this direction may assist in better safety management in organisations (Burke et al., 2002). Vinodkumar and Bhasi (2009), Siu et al. (2003) as well as Gyekye and Salminen (2009) indicated that employees' safety perception is

positively related to age. Vinodkumar and Bhasi (2009) found that age and experience have significant effects on safety perceptions. Safety climate scores were found to be high for younger and older employees but reduced for the middle group. The case was the same for years of service or length of experience. They suggested that younger employees have positive safety attitudes and perceptions when they start working. For older employees, they argued that their positive safety perception may be due to their experience. As such, older employees may have become more safety conscious over time as they work in the organisation. They suggested that for the middle-aged-group training is necessary to change their safety attitudes and perception.

Similarly, Siu et al. (2003) indicated that older employees have positive safety perceptions. They explained that this may be due to the fact that older employees are committed to remaining in or keeping their jobs since there may not be available jobs for them should they lose their jobs. They also mentioned that the experience accumulated by older employees over time will shape their attitudes towards safety issues. However, safety perception is found to increase with age. Although they did not find a linear relationship between age and occupational injury, the rate of injury increases with age and declines later. Gyekye and Salminen (2009) reported that among industrial workers in Ghana, older employees had more positive and constructive perceptions of workplace safety. They expressed much enthusiasm with regard to safety levels in their work environments than did their younger colleagues. Thus, older employees reported lower accident frequency. Similar to Vinodkumar and Bhasi (2009), Gyekye and Salminen (2010) found that experienced workers had better safety perceptions of their work environments than inexperienced workers. Experienced workers also adhered to safety policies and reported low accident rates while inexperienced workers reported the opposite. The authors posit that experienced workers may have gained better knowledge and

understanding of the organisation's safety culture and job procedures. This may explain their low involvement in accidents and high safety perceptions.

Other researches identify differences in employee safety based on positions and work tenure. Dahl (2013) reported that offshore contract staff who were involved in more routinized work did not value in-depth knowledge of safety rules and procedures. Thus, they were not familiar with governing documentation. Routine work is associated with low patronage of protective equipment, violation of and ignorance of safety procedures (Zohar & Erev, 2007). Meanwhile, Vinodkumar and Bhasi (2009) observed that supervisory staff scored highly on safety climate as compared to other employees. Based on these findings, they suggested that in developing safety strategies, management should consider these differences.

Education shapes thinking processes, drives it to be more strategic, influences how information is processed and further develops problem solving capacities (Gyekye & Salminen, 2009). Thus, education is likely to influence employees' safety perception and response to safety issues. Gyekye and Salminen (2009) and Vinodkumar and Bhasi (2009) found that qualification significantly affects safety perceptions. Vinodkumar and Bhasi (2009) reported that employees with higher educational qualifications also scored higher on safety measurements. They suggested that employees with higher qualifications may have positive attitudes towards safety rules and regulations due to their ability to understand safety hazards, procedures and consequences better than their colleagues with lower qualifications. They advocate for employees with lower qualifications to be trained and educated in order to change their current negative perceptions of safety. Employees with higher educational backgrounds tend to occupy higher positions which may expose them to safer conditions than their lower educated colleagues (Gyekye & Salminen, 2009). Gyekye and Salminen (2009) further stated that the higher accident rates observed for employees with low educational qualifications may

be due to the casual nature of their tenure at work (in some cases), as compared to highly educated employees who are usually permanent staff.

Few studies have linked safety to gender. Indeed, Jensen et al. (2014) posits that there is no evidence to indicate the importance of gender in safety research. However, Courville, Vezina and Messing, (1991; 1992) indicated that women may be more involved in accidents at work because the tools, equipment and work stations they use were designed to be used by men. Messing, Courville, Boucher, Dumais, and Seifert (1994) in a similar report identified the tools and equipment used by women in their study to be ill adapted to their size. They stated that this may have resulted in pains experienced by the women. Again, Messings et al. (1994) reported that men and women experienced the same accidents at work. However, the proportion of accidents differed with their status as temporary or permanent workers. Wingard (1984), on the other hand, asserts that women are may be involved in few accidents because they follow safety precautions.

### **Safety Behaviour and Personality**

Personality has been researched in relation to several job-related constructs; selection, job satisfaction, occupational stress, organisational citizenship behaviour, organisational justice. Most studies that have linked safety behaviour and personality focused on the traditional five factor personality identified by Costa and McCrae (1988). For instance, Wallace and Chen (2006) indicated that a positive relationship exists between conscientiousness and safety performance. Beus, McCord, and Dhanani (2015) reported similar findings. In their study, high levels of conscientiousness as well as agreeableness and safe behaviour were positively related. Highly conscientious employees contribute more to safety and productivity in organisations (Wallace & Chen, 2006). Further, Wallace and Chen (2006) posited that regulatory strategies which fully mediated the relationship between the two variables suggests

that conscientious employees are able to regulate their behaviours more effectively. Thus, they adopt promotion and prevention strategies and this explains their safety performance and productivity. The authors argued that their findings validated conscientiousness as a construct to be considered in employee selection.

Altruism, impulsiveness and sensation-seeking as facets of the Five Factor Model have strong associations with safe behaviour (Beus et al., 2015). The findings of Andel (2015) also indicated that high conscientiousness predicts safety performance. Contrary to the findings of most studies, she found high levels of extraversion to be positively related to safety performance. Seibokaite and Endriulaitiene (2012) found personality to be strongly related to driving errors than driving violations. Their finding is contrary to that of Reason (1990) which suggested that violations are more strongly related to personality because they are of social and motivational nature. Meanwhile, errors are more concerned with information processing. Seibokaite and Endriulaitiene (2012) explained that the drivers may have denied violations committed in order to keep or protect their positions or jobs. Conversely, Pusilo (2013) reported no significant relationship between personality and safety performance, although safety climate was found to have strong associations with safety performance.

### **Proactive Personality and Safety Behaviour**

Various studies indicate that individuals with proactive personality have different expectations about their control over their environment (Baba, Tourigny, Wang & Liu, 2009; Allen, Weeks, & Moffitt, 2005; Brown, Cober, Kane, Levy, & Shalhoop, 2006). Bateman and Crant (1993) indicated that while proactive employees persevered to cause meaningful change, showed initiative and sought for opportunities, non-proactive employees were less likely to take hold of opportunities to effect changes and did not take initiative. Seibert, Kraimer and Crant (2001) found that proactive employees controlled their environment by exhibiting

proactive behaviour. In a meta-analysis of proactive personality studies, Spitzmuller, Sin, Howe, and Fatimah (2015) found that proactive personality had incremental validity in predicting job outcomes such as job performance, task performance and organisational citizenship behaviours.

In the past few years safety researchers have begun to pay more attention to safety proactivity or proactive behaviours directed at employee or organisational safety. Various constructs similar to safety proactivity have been identified by some researchers (Curcuruto & Griffin, 2016), for example, safety participation by Neal and Griffin (2000) and safety citizenship by Hoffman, Morgerson and Gerras (2003). However, there have been few studies linking safety behaviour and safety climate to proactive personality. Research by Baba et al. (2009) suggested that people with proactive personality are more concerned about safety climate of their work environments. They perform better in a work environment with positive safety climate. Investigating the interaction between proactive personality and individual performance among Chinese airline employees, Baba et al. (2009) found that perceived safety climate moderated the relationship between proactive personality and individual performance. Similar to the assertion of Bateman and Crant (1993), Seibert et al. (2001) and Crant (1995) they explained that proactive individuals are able to take greater initiative even when they are emotionally exhausted as a result of low perceived safety climate. This is in sharp contrast to employees who are not proactive. They tend to perform poorly in negative safety climate (Baba et al., 2009). Proactive personality is likely to moderate the relationship between safety climate and safety behaviour because safety requires individuals to take charge over their environment using their knowledge and motivation (Neal & Griffin, 2000). Parker, Bindl and Strauss (2010) maintain that proactive personality affects job outcomes through three proactive motivational states; “reason to”, “can do” and “energized to” states (as cited in Spitzmuller, Sin, Howe & Fatimah, 2015). The “can do” state, for instance, is thought to have strong influences on job

performance. With safety protocols and measures laid out as aspects of job performance of fuel attendants, proactive personality is likely to exert some influence on the safety climate-safety behaviour relationship.

### **Summary of Related Studies**

Studies by various researchers make different assertions about the safety climate-safety behaviour relationship. Researchers such as Siu et al. (2003) and Mearns et al. (2003) indicate a partial relationship between the two constructs. On the other hand, Sadulla and Kantan (2009), Wu et al. (2008), Shin et al. (2015), Panuwatwanich et al. (2017), Froko et al. (2015) and Adutwum (2010) found a positive relationship between safety climate and safety behaviour. Meanwhile, Shaheen et al. (2014) did not find any relationship between the two constructs. Bayire et al. (2015) and Horbah et al. (2017) state that with high safety climate, employees are less likely to engage in risky behaviour.

Relating demographic characteristics to safety perception and safety behaviour, Gyekye and Salminen (2009) and Siu et al. (2003) found that safety perceptions of employees increases with age. Thus, older employees tend to have higher safety perceptions. Experienced employees also tend to have better safety perceptions than inexperienced employees (Vinodkumar & Bhasi, 2009; Gyekye & Salminen, 2010). Again, employees with higher educational qualifications have positive attitudes towards safety rules (Vinodkumar & Bhasi, 2009; Gyekye & Salminen, 2010). Few safety studies have paid attention to gender differences. Messings et al. (1994) asserts that there are no differences in safety performance across genders while Courville et al. (1991; 1992) maintains that women are more involved in accidents at work.

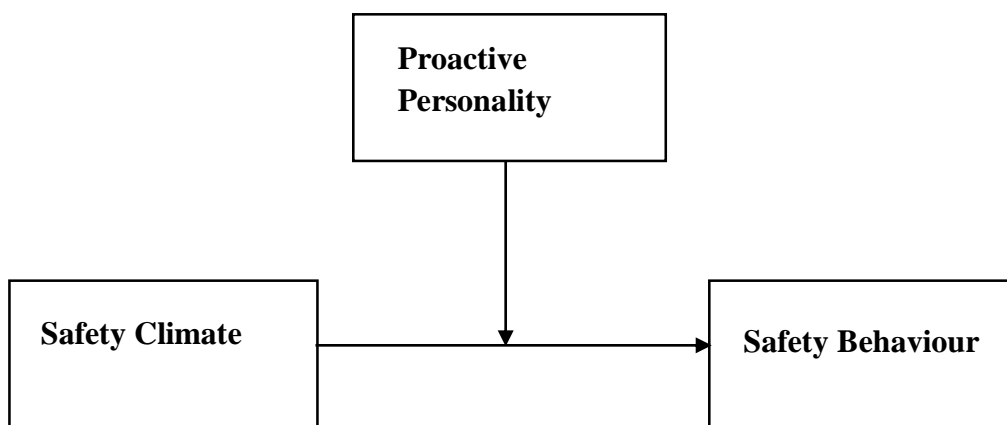
Baba et al. (2009) indicate that people with proactive personality perform well in work environment with positive safety climate. This is mainly explained by the propensity of people

with proactive personality to take initiative in any environment and also by the motivation to engage in work (Bateman & Crant, 1993; Seibert et al., 2001; Crant, 1995). Thus, affecting job outcomes in various ways.

### Research Hypotheses

- There will be a positive relationship between safety climate and safety behaviour.
- There will be a positive relationship between proactive personality and safety behaviour.
- Proactive personality will moderate the relationship between safety climate and safety behaviour.
- Female fuel attendants will score higher on safety behaviour than will their male counterparts.
- Fuel attendants with higher educational level will have more positive safety behaviour than those with lower educational level.

### Hypothesized Model of Interaction



**Fig 2. Hypothesized Model of Interaction between Safety Climate, Safety Behaviour and Proactive Personality**

## **CHAPTER THREE**

### **METHODOLOGY**

#### **Design**

The study was conducted using a cross-sectional design. A cross-sectional design involves studying people who differ on certain characteristics but share some other characteristics at a specific point in time. In the current study, the cross-sectional design was employed because participants share a common job or work but differ in terms of characteristics such as age, income level and socio-economic background and they were studied at one point in time.

#### **Sample and Sampling Procedure**

Using purposive sampling technique, fuel stations of varying companies were selected for the study. The following fuel companies were included in the study; Shell, Goil, Oando, Glory Gas, Glory Oil, Sonnidom, Unity Oil, Agapet, AP Oil, Puma Energy, EV Oil, Rich Oil, Royal Roses, Infin, Kaysens Gas, Top Oil, Excel Oil, Petrosol, AP Oil, Allied Oil, Seam Oil, Benab, Sky Petroleum, Lucky Oil, Compass Oleum and Frimps Oil. This sampling technique helped in ensuring that about a quarter of oil marketing companies in the country were represented in the current study. This technique was also employed in order to recruit individuals with knowledge in the topic area.

Convenience sampling technique was employed in recruiting fuel attendants from fuel stations located in Madina, Legon, 37 township, Tema, Dansoman, Nima, Airport, Afienya road, Sakumono, Trade Fair, Achimota, Cantonments, Ofankor, Spintex Coca Cola roundabout, Sakumono, Teshie, Sowutuom and Taifa. This method helped in giving the researcher easy access to participants.

A sample size of 245 fuel station attendants participated in the study. Survey questionnaires were distributed to them to complete. About 220 of the questionnaires were returned with 206 fully completed. All fuel station attendants aged 18 years and above who had at least a basic form of education were included in the study. However, managers and supervisors of fuel service stations were excluded from the study because the current study focuses on studying the safety behaviour of fuel station attendants. Mart attendants, and lube mechanics were also excluded from the study because they did not fall in the category of fuel attendants. Again, fuel attendants who did not have any form of education were not included in the study. This is because provisions were not made for translation of the questionnaire into any local dialect.

### **Participants**

Fuel station attendants in Accra between the ages of 18-66 years were recruited for the study from various fuel stations where they work. The study was focused on fuel attendants who work with Oil Marketing Companies (OMCs) in Accra. They are usually responsible for serving or dispensing fuel to customers.

Out of 206 participants in this study, 139 (67.5%) were male and 67 (32.5%) were female. The ages of participants ranged between 18 years and 66 years, with 175 (85%) among the age range of 17-30 years and 31 (15%) among the age range of 31-66 years (see Table 2).

### **Measures**

A questionnaire survey was used to collect data. The questionnaire had four different sections. The first section measured demographic data of participants, namely gender, age, marital status, religion, highest educational level and years of experience. The second section

measured safety climate perception, the third section measured safety behaviour and the fourth part measured proactive personality.

***Safety Climate Scale (Adutwum, 2012)***

The Safety Climate Scale by Adutwum (2012) was used to measure safety climate. It is a 17-item scale which measures different facets of safety climate namely; Co-worker value for safety, Safety communication, Supervisory monitoring and recognition. Ratings for responses on the scale are 1=Strongly Disagree, 2= Disagree, 3=Uncertain, 4= Agree, and 5= Strongly Agree. While higher scores on the scale indicate higher safety climate, lower scores on the scale indicate poor safety climate. The scale has a minimum total score of 18 and a maximum total score of 90.

The safety communication dimension makes up the first six items of the scale. It measures the degree to which employees have information concerning safety events, the rate at which employees are consulted to contribute to safety issues and any consequences associated with doing this. Items 7 to 11 measure the co-worker value for safety dimension. It measures the perception employees have concerning their colleagues' involvement in caring for each other's safety. The supervisory monitoring and recognition dimension measures employees' perception of their supervisors' monitoring activities with respect to safety behaviour and whether workers who adopt safe practices are acknowledged. It is measured by items 12 to 15. The final dimension; Production pressure dimension measures the expectations other employees have of participants when safety seems to interfere with production.

Sample items on the scale include: "Workers in this unit are usually consulted for suggestions about how to improve safety", "Workers in this unit are given sufficient information about safety incidents that occur throughout", "My co-workers take immediate actions to correct safety hazards/risks they notice in this units", "My supervisor frequently

checks to see if workers are all following safety rules” and “Taking short cut to get a work done quickly is accepted among members of my work crew as long as everything goes well and nothing happens” . The scale has a Cronbach alpha reliability coefficient of .76.

***Safety Compliance and Safety Participation Scale (Vinodkumar & Bhasi, 2010)***

Safety behaviour was measured using 12 items developed by Vinodkumar and Bhasi (2010). Items on the scale are rated on a 5-point Likert scale ranging from strongly disagree to strongly agree. Some items on the scale include, “Occasionally due to over familiarity with the job I deviate from correct and safe work procedures”, “It is not always practical to follow all safety rules and procedures while doing a job,” “I help my co-workers when they are working under risky or hazardous conditions”, “I always point out to the management if any safety related matters are noticed in my company”. The coefficient alphas were .74 for safety compliance and .78 for safety participation, in this study.

***Proactive Personality Scale (Bateman & Crant, 1993)***

The 10-item version of Proactive Personality Scale by Bateman and Crant (1993) was used to measure proactive personality. Some items on the scale include, “Nothing is more exciting than seeing my ideas turn into reality” and “I am always looking for better ways to do things”. Although responses on the scale was originally rated on a 7-point Likert scale by Bateman and Crant (1993), rating of responses on the scale was modified to a 5-point Likert scale in the current study. This was done in order to increase response rate (Babakus & Mangold, 1992; Hayes, 1992), considering the busy nature of the population of this study. High scores on the scale reflect higher levels of proactive personality while low scores on the scale reflect lower levels of proactive personality. Seibert, Crant and Kraimer (1999) reported a Cronbach alpha of .86. In this study, an alpha coefficient of .84 was observed.

## **Data Collection**

An introductory letter obtained from the Department of Psychology, University of Ghana was sent to fuel stations prior to data collection to seek for the permission of managers to engage employees in the study. Permission was sought from managers of the fuel stations to engage fuel attendants to participate in the study. In the absence of station managers, shift captains were contacted to seek for permission in engaging their shift members.

Fuel attendants were recruited for the study during their working hours. Fuel attendants were given information pertaining to the study, filling in the questionnaire and their concerns were addressed during engagement sessions. The researcher explained to the attendants present that participation was not mandatory for any reason. Fuel attendants who expressed disinterest in participating in the study were excluded from the study and those who gave their consent were engaged. Data collection was driven by work pressure at the various stations. Hence, questionnaires were left with fuel attendants to be collected at most a fortnight after at stations where there was high work pressure. This ensured that the study would not interfere with attendants' discharge of duties at these stations. At such stations, the researcher made her contact number available to participants, usually through the shift captain. This was for participants to contact the researcher to handle any issues or questions participants may have when filling questionnaires. Again, at stations where work pressure was less, participants filled in questionnaires and handed it over to the researcher in about 15-30 minutes. The researcher was available to address any issue that may have been encountered by participants when filling in the questionnaire. The researcher was available to provide clarifications on aspects of the questionnaire that respondents did not fully understand.

### **Data Analyses**

IBM SPSS (Statistical Package for Social Science) software version 21 was used to analyse data collected. Specifically, the following statistical tests were used to test the various hypotheses of the study. Hierarchical multiple regression was used to test hypotheses 1 to 3. Independent *t-test* was used to determine the differences in safety behaviour among male and female fuel attendants (hypothesis 4). To determine the differences in safety behaviour exhibited by fuel attendants based on their level of education, the Analysis of Variance (ANOVA) test was used.

### **Ethical Considerations**

Ethical clearance for the study was obtained from the Ethics Committee for Humanities of the Institute of Statistical, Social and Economic Research (ISSER), University of Ghana, Legon. To ensure the anonymity of participation and confidentiality of survey responses, participants were not required to indicate their names or identification numbers (ID) numbers of any form on questionnaires given to them. Rather, all questionnaires were identified using numeric codes such as 001, 002, 003 etc. Data collected will not be handed over to other researchers or other parties for their own use of any form. Participants also had the right to withdraw from the study at any point in time when they wanted to. However, none of the participants expressed any intention to leave the study. No form of coercion was employed in getting participants for the study.

## CHAPTER FOUR

### RESULTS

#### Preliminary Analysis

This part of data analysis was conducted to establish the normality of data, descriptive statistics, construct validity and reliability. This was also done as the best psychometric practice.

#### Normality and Descriptive Statistics of Variables

To conduct parametric statistical analysis, it is necessary that scores have a normal distribution. To establish this, kurtosis indices of -7 to +7 and skewness indices of -2 to +2 must be observed (West, Finch, & Curran, 1995). It can be observed from the Table 1 below that skewness and kurtosis for the various variables were within normality. Skewness and kurtosis for safety climate was within normal ranges of -2 to +2 and -7 to +7, respectively. Safety compliance, safety participation and proactive personality were normally distributed in terms of skewness (-1 to +1). This indicates that the scores were within normal ranges (Field, 2009). The means and standard deviations of the independent and dependent variables were computed.

*Table 1: Summary of Means, SD, Skewness, Kurtosis and Reliability of Variables (N= 206)*

<b>Variables</b>	<b>Mean</b>	<b>SD</b>	<b>Skewness</b>	<b>Kurtosis</b>	<b>Cronbach Alpha</b>
Safety Climate	15.54	3.29	-1.25	1.79	.76
Safety Compliance	16.57	2.62	-1.34	3.47	.74
Safety Participation	20.03	3.61	-1.16	2.03	.78
Proactive Personality Scale	41.32	5.62	-1.48	5.55	.84

### **Exploratory Factor Analysis**

Exploratory factor analysis was conducted using Principal Component Analysis with direct oblimin. This helped to determine if items on the various scales contributed to measuring the various constructs (Field, 2009). For the Safety Climate Questionnaire, four components had eigenvalues above Kaiser's criterion of 1. These components together accounted for 57.23% of variance. On their primary factors, all items showed factor loadings  $>.40$ . However, four items loaded on to more than one component. Further, it was observed that items loaded much better on component one which explained 32.56% of variance. The items from this component were extracted for further investigation. This led to the retention of items 1, 2, 3 and 5. Two components of the Safety Compliance Scale had eigenvalues above Kaiser's criterion of 1. These components together explained 62.32% of variance. Items 5, 6 and 7 were eliminated because their loadings were below  $.40$ . All items on the Safety Participation Scale and Proactive Personality Scale were retained as the factor loadings were  $>.40$  (Field, 2009).

### **Reliability Analysis of Scales**

In order to establish reliability of the various scales, the Cronbach alpha of the various scales were computed. With Cronbach alphas ranging from  $.74$  to  $.84$  (see Table 1), the analysis showed that all the scales had alpha values above  $.70$  which is acceptable for psychometric analysis (Wells & Wollack, 2003).

Table 2: *Summary of Demographic Characteristics of Participants*

<i>Variable</i>	<i>Frequency</i>	<i>Percentage</i>
<b>Age</b>		
18-30	175	85%
31-66	31	15%
<b>Gender</b>		
Male	139	67.5%
Female	37	32.5%
<b>Marital Status</b>		
Single	161	78.2%
Married	45	21.8%
<b>Religion</b>		
Christianity	188	91.3%
Islam	17	8.3%
Other	0	0%
<b>Highest Educational Level</b>		
Junior High School	24	11.7%
Senior High School	164	79.6%
Diploma	13	6.3%
Degree	5	2.4%
<b>Experience in the Industry</b>		
Below a year	15	7.3%
1-2 years	101	49%
3-5 years	61	29.6%
6-10 years	24	11.7%
10 years and above	5	2.4%

Table 3: Summary of Inter-correlations among the Variables

Variables	1	2	3	4	5	6	7	8	9
1 Age	-								
2 Gender	-0.21**	-							
3 Marital Status	-0.46**	0.14*	-						
4 Religion	0.34	-0.07	-0.03	-					
5 Educational Level	-0.24**	-0.03	0.11	0.06	-				
6 Experience	0.52**	-0.13	-0.27**	0.07	-0.10	-			
7 Safety Climate	0.03	-0.02	0.02	0.03	-0.08	-0.01	-		
8 Safety Behaviour	0.14	-0.12	-0.04	0.04	-0.07	0.12	0.41**	-	
9 Proactive Personality	0.18**	-0.14*	-0.004	0.05	-0.10	0.13	0.39**	0.84**	-

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

The correlation matrix in Table 3 shows that the demographic characteristics of respondents did not have any significant relationship with safety behaviour. However, proactive personality had a weak positive relationship with the age of participants ( $r = 0.18$ ,  $p < 0.01$ ). This implies that older participants are more likely to score high on proactive personality. Again, proactive personality had a weak negative relationship with gender ( $r = -0.14$ ,  $p < 0.05$ ). Thus, there may be key differences among the genders when considering proactive personality. A weak positive relationship was observed between safety climate and proactive personality ( $r = 0.39$ ,  $p < 0.01$ ). This implies that one is more likely to be proactive in a safety-supported workplace.

### Main Analysis

Five hypotheses were tested. Hierarchical multiple regression was used in testing hypothesis one, two and three. Independent t test and One Way Analysis of Variance test were used to test hypotheses four and five, respectively. Results of the hierarchical regression are shown in Table 4.

Hierarchical multiple regression was conducted to test the first three hypotheses. Aiken and West's (1991) approach for testing moderation analysis was followed. The predictor variables were centered prior to the calculations. In step 1, safety climate perception and proactive personality were entered individually in the model. In second step, the product of safety climate and proactive personality (i.e. interaction term) was included in the model. Table 4 shows the results for these analyses.

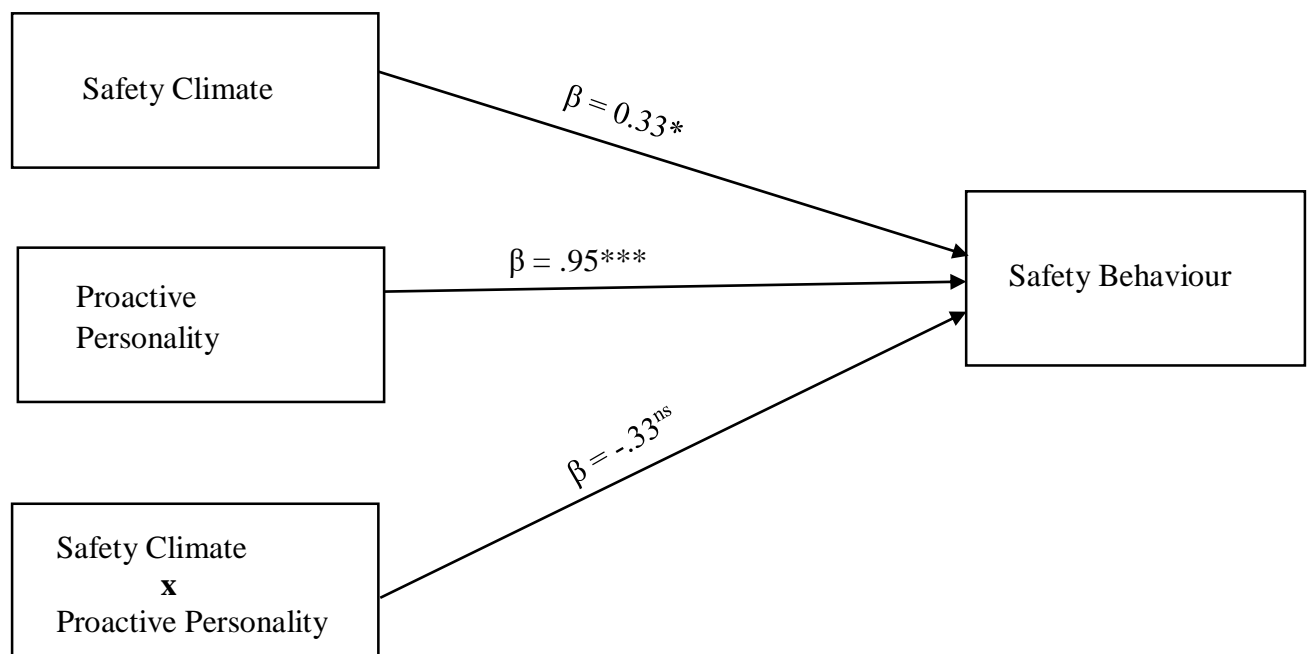
Table 4: *Examining Proactive Personality as a Moderator between Safety Climate and Safety Behaviour*

<i>Model</i>	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i>
<b>Step 1</b>				
Constant	1.44	.69		.038
Safety Climate	.07	.03	.09*	.024
Proactive Personality	3.44	.17	.81***	.000
<b>Step 2</b>				
Constant	-.98	1.78		.585
Safety Climate	.26	.13	.33*	.049
Proactive Personality	4.05	.45	.95***	.000
Safety Climate x Proactive Personality	-.05	.03	-.33	.143

*Step 1:  $F=259.88$ ,  $R^2= .719$ ; Step 2:  $F=174.96$ ,  $R^2= .722$ ,  $\Delta R^2= .003$ ,  $N=206$ ; \* $p<0.05$ , \*\*\* $p<0.001$*

In the first step of the regression analysis, safety climate and proactive personality were entered as predictors. The model was significant,  $F(2, 203) = 259.88$ ,  $p < .001$  and explained 72% of variance in safety behaviour. Both predictors significantly predicted safety climate (see Table 4). After including the interaction term at step two, the model explained a total variance of 72% in safety behaviour. The interaction term explained 0.3% of variance in safety behaviour ( $\Delta R^2= .003$ ,  $F(3, 202) = 174.96$ ,  $p < 0.001$ ), after controlling for safety climate and

safety behaviour. Again, safety climate ( $\beta = .33, p < 0.05$ ) and proactive personality ( $\beta = .95, p < 0.001$ ) were statistically significant. However, the interaction term was not statistically significant ( $\beta = -.33, p = .143$ ). Therefore, proactive personality did not moderate the relationship between safety climate and safety behaviour. This indicates that hypothesis three which states that, “Proactive personality will significantly moderate the relationship between safety climate and safety behaviour of fuel attendants” was not supported. Following the findings of the hierarchical regression analysis, the observed model of the study is presented in Figure 3.



**Figure 3:** Observed model of the study.

### Independent t-test and ANOVA results

Independent t-test and ANOVA were conducted to examine differences in safety behaviour by employee gender (Hypothesis 4) and by educational level (Hypothesis 5). The results are reported in Table 5 and Table 6.

Table 5: *Summary of Differences in Safety Behaviour among Male and Female Fuel Attendants*

<i>Gender</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Male	139	20.35	3.35	1.833	204	.068
Female	67	19.37	4.06			

From Table 4, it can be seen that there are no significant differences among male fuel attendants ( $N = 139$ ,  $M = 20.35$ ,  $SD = 3.35$ ) and their female colleagues ( $N = 67$ ,  $M = 19.37$ ,  $SD=4.06$ ) in safety behaviour (see Table 5),  $t(206) = 1.833$ ,  $p > .05$ . Therefore, hypothesis four was not supported. To conduct the One-Way Analysis of Variance, educational level of participants was categorised into four: Junior high school, Senior high school, Diploma, and Degree. There was no difference in safety behaviour among fuel attendants in terms of their educational level,  $F(3, 202) = .28$ ,  $p = .28$  (see Table 6). Thus, hypothesis five was rejected.

Table 6: *Summary of Differences in Safety Behaviour among Fuel Attendants with Different Educational Qualifications*

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
Between groups	3	50.163	16.72	1.28	.28
Within groups	202	2626.599	13.00		
Total	205	2676.762	16.54		

### Summary of findings

The results show that hypothesis 1 was supported as a significant positive relationship was found between safety climate and safety behaviour.

Hypothesis 2 was also supported since a significant positive relationship was found between proactive personality and safety behaviour.

Hypothesis 3 was not supported since proactive personality did not moderate the relationship between safety climate and safety behaviour.

Hypothesis 4 was also rejected because no significant differences were found in safety behaviour among male and female fuel attendants.

Hypothesis 5 was not supported. Fuel attendants with higher educational level did not have more positive safety behaviour than those with lower education.

## CHAPTER FIVE

### DISCUSSION

#### Discussion of Findings

The main aim of the study was to examine the relationship between safety climate and safety behaviour. The study also examined the relationship between proactive personality and safety behaviour. Further, the study interrogated the extent to which proactive personality would moderate the relationship between safety climate and safety behaviour. The study also examined differences in safety behaviour of male fuel station attendants and female fuel station attendants. Finally, the study compared the safety behaviour of fuel station attendants with high educational level to that of those with lower educational level.

The results of the study indicates that the first hypothesis was supported. This implies that there is a positive relationship between safety climate and safety behaviour of fuel station attendants. The finding indicates that employees who have positive safety climate are more likely to engage in safety behaviour, that is, complying with laid down safety rules and protocols as well as taking safety-related initiative in the organisation. The reverse is true, implying that employees with poor safety climate are likely to have poor safety behaviour. This finding is similar to that of Wu et al. (2008), Froko et al. (2015), Bayire (2015), Shin et al. (2015) and Panuwatwanich et al. (2017). Wu et al. (2008) indicated that safety leadership is a crucial factor in creating the right safety climate. They assert further that management's attitude towards safety issues, accidents and safety equipment influences safety climate of employees, as well as their safety behaviour.

Similarly, Froko et al. (2015) explained that employees who feel that their organisations support their safety act safely on the job. They engage in safety behaviours and obey rules to ensure their safety and that of other employees. Shin et al. (2015) found a positive relationship

between safety climate and safety behaviour. They indicate that management values and indirect supervisor influence, as sub-dimensions of safety climate have an indirect influence on safety behaviour. Through their influence on safety knowledge, safety motivation and affective commitment, employees' safety behaviour is influenced. This indicates that management's value or interest in health and safety issues of employees will affect safety knowledge of employees and finally influence their safety behaviour. Bayire (2015) also posits that employees with positive safety climate may rarely be engaged in risky behaviours at work. Panuwatwanich et al. (2017) also reported a positive relationship between safety climate and safety behaviour. They suggested that safety motivation only is not enough to change employees' safety behaviour. However, employers and managers must focus on creating the right environment to promote positive safety climate while organising programmes that will also motivate employees to maintain a positive attitude towards safety of the organisation. In ensuring that employees have a positive safety climate, factors such as safety leadership, safety training, safety motivation and provision of safety equipment must be critically considered. These factors affect the safety perception of employees to a very large extent and also influence their safety skills, knowledge and motivation and eventually affects their safety behaviour.

Proactive personality was found to have a positive relationship with safety behaviour. That is to say fuel station attendants with proactive personality will act more safely at work than their colleagues who do not have proactive personality. Although few studies have linked safety behaviour and proactive personality, Baba et al. (2009) maintained that people with proactive personality value the safety climate of their workplace, and as such, perform better in a positive safety climate. Studies (Wallace & Chen, 2006; Beus et al. 2015) that have linked the Big Five personality facet to safety behaviour have identified a positive relationship between conscientiousness and safety performance. Wallace and Chen (2006) indicated that conscientious employees are more likely to espouse promotion and prevention strategies which

results in better safety performance, on their part. Parker et al (2010) have identified three motivational states by which proactive personality affects job outcomes. The “can do”, “energised to” and “reason to” states may explain the strong relationship between proactive personality and safety behaviour. Once the employee thinks he or she can (“can do”) or has the ability to act safe, in terms of skills, knowledge and other personal characteristics, he or she is likely to think (“reason to”) of acting safely or engaging in safe behaviour, both mandatory and optional, on the job. The employee will be motivated (“energised to”) to act safely on the job with such states already at work within.

Further, the Workplace Safety Model by Neal and Griffin (2002) establishes that individual factors such as personality account for differences in safety behaviour. Hence, employees who score differently on proactive personality will exhibit differing levels of safety behaviour at work. Seibert et al. (2001) stated that proactive employees influence their environment by exhibiting proactive behaviour. Employees’ proactive behaviour protects the organisation, causes a change in a different direction or ensures that the organisation’s processes are not destroyed (Conchie, 2013). Proactive employees take initiative, cause significant change and seek for opportunities (Bateman & Crant, 1993). Employees with proactive personality will take more safety-related initiative, follow laid down safety protocols and lead or support safety promotion at work.

The hypothesis in this study that stated, “Proactive personality will moderate the relationship between safety climate and safety behaviour” was not supported. This means that proactive personality does not alter the direction and strength of the relationship between safety climate and safety behaviour. The relationship between safety climate and safety behaviour remains the same in the presence of proactive personality although proactive personality has a positive relationship with safety behaviour. This may be explained by the fact that the relationship between safety climate and safety behaviour is stronger on its own. Hence, the

presence of proactive personality has little or no influence on the relationship. This finding suggests that safety climate, that is, the individual's perception of safety in his or her workplace is the most important factor in determining his or her safety behaviour. It suggests that creating an environment that promotes safety of employees is of much essence in changing their safety behaviour or reinforcing it (in a situation where it is already positive).

Although proactive behaviour results in taking initiative (Bateman & Crant, 1993) and challenging the status quo (Crant, 2000; Parker et al. 2006), it is not a strong factor in influencing the relation between safety climate and safety behaviour. This implies that when an employee has proactive personality, if he or she perceives the organisation to be unsupportive of employees' safety, he or she will not act safely on the job. The opposite is true, where an employee with proactive personality will act safely when he or she perceives the organisation to be supportive of employees' safety. In other words, the relationship between safety climate and safety behaviour remains the same in the presence or absence of proactive personality, that is, whether an employee has proactive personality or not.

There were no significant differences in safety behaviour of female fuel station attendants and male fuel station attendants. Most studies focused on safety behaviour have not considered gender differences in terms of safety behaviour. However, the finding may be as a result of availability of the same resources to both male and female fuel station attendants. According to Messings et al. (1994), men and women experience the same accidents at work. They indicate further that their status as temporary or permanent workers is a major factor which shows the proportion of accidents. At fuel stations, male and female fuel attendants have the same tenure as employees. They tend to work on the same work schedule, following a shift system. Again, both male and female fuel attendants have equal rest or off schedule days. Thus, experiencing the same terms and conditions at work may have resulted in similar safety behaviour among male and female fuel attendants. Although Wingard (1984), posits that

women may be involved in few accidents because they adhere to safety precautions, there may not be gender differences in safety behaviour in this particular context because fuel attendants are required to adhere to particular safety protocols at work.

The Workplace Safety Model (Neal & Griffin, 2002) posits that the amount of knowledge, skills and motivation available to the individual influences his or her safety behaviour. Hence, it may be inferred that these factors are major determinants in safety performance. Thus, individual factors may have an influence on safety behaviour but it is not strong enough to surpass the accumulation of safety knowledge, skills and motivation. This implies that on the job, gender difference is not a strong factor in determining how one will respond to safety issues or situations. Again, males accounted for a higher percentage of participants in the study. This may be another reason why there was no difference in safety behaviour of male and female fuel attendants. It is possible that the number of females in the study was not large enough to influence the large male number in the study.

Fuel station attendants with higher educational levels did not differ in terms of safety behaviour from their colleagues with lower educational levels. Contrary to the findings of Vinodkumar and Bhasi (2009), no significant difference was found in the safety behaviour of attendants with different educational qualification. Gyekye and Salminen (2009) indicate that often employees with higher educational backgrounds work in roles higher than those of lower educated employees. Their work conditions may be safer than that of their colleagues with lower educational qualification. This is not the case for fuel station attendants. The non-significant relationship between education and safety behaviour may be as a result of the fuel station attendants being exposed to the same work conditions regardless of their educational qualification. All fuel station attendants receive the same treatment as such, they encounter the same level of safety in their work environment which affects their behaviour. Among fuel station attendants, educational level may not be a significant indicator of unsafe behaviour

which results in accidents. This may be as a result of both high educated and low educated fuel attendants being assigned the same tasks and the same tenure at work. Again, they undergo the same level of safety training, motivation as attendants at various fuel stations. The finding indicates that to influence safety behaviour of fuel station attendants, managers must not necessarily consider their unique educational qualification. Safety training and other safety-related activities must be planned to involve all fuel attendants regardless of their educational qualification. More attention should be given to directing fuel attendants to understand and follow technical aspects of the job, including safety protocols. Proper grasp of the technical aspects of the job ultimately may reflect in positive safety behaviour.

### **Recommendations**

Considering the strong relationship established between safety behaviour and proactive personality, managers and human resource departments of oil marketing companies must reconsider their selection processes. Incorporating personality assessment as part of the selection process for fuel station attendants will contribute positively to operations of fuel stations. Interviews form the majority of the selection process in most fuel stations. Knowing the relationship between proactive personality and safety behaviour, it is important that managers consider the best way to determine the level of applicants' proactivity during selection. This will help in assessing if the individual will exhibit proactive behaviour on the job or not. In selecting employees with high proactive personality, the organisation is taking a step closer to managing safety issues better and promoting better safety behaviour.

Again, managers and other organisational leaders must be committed to providing a safety-supportive work environment to their employees. This is based on the finding that fuel attendants will act more safely when they consider the organisation to be more supportive of their safety. Necessary safety equipment, safety training, safety information sessions and other

safety-related activities must be provided for employees. Safety concerns as well as safety-related suggestions raised by employees must also be considered. Together, these factors will contribute to creating better safety perceptions among employees.

Also, fuel station managers and oil and gas companies in the country should consider drawing and implementing training programmes which will influence the proactivity of fuel station attendants. The Workplace Safety model (Neal & Griffin, 2002) highlights the importance of skills, knowledge and motivation in the safety climate-safety behaviour relationship. Hence, training may affect employees to be more proactive in engaging in safety behaviours at work. It may also be a means of motivation for employees to engage in behaviours which will make the workplace much safer.

Also, various institutions such as National Petroleum Authority (NPA) and Environmental Protection Agency (EPA) should be more consistent in undertaking routine checks at fuel stations in the country. By performing routine checks, the authorities will be able to identify fuel stations which may be flouting specific safety protocols or procedures. Thus, it will be easier to sanction culprits. A clamp down on such culprits will deter other fuel station managers from paying less attention to safety issues at work. Nevertheless, fuel stations in good standing regarding safety may be commended and awarded to encourage them and other organisations in the industry. Routine checks on fuel stations will also help in assessing the safety of their environment. Having established the importance of a safety supportive work environment, authorities must be actively involved in ensuring that fuel stations conform to maintaining high safety environment. This will go a long way to influence safety behaviour of fuel station attendants.

### **Limitations**

Data for the study was collected using a self-report survey. It is likely that the responses of some participants may have been influenced by social desirability. Due to the presence of

the researcher during data collection, it is possible that some participants may not have given their honest responses to the questionnaire items. This may be mainly due to the fact that some of these respondents may have wanted to give responses that will project them and their organisations in a positive light to the researcher. Further, the study did not use a random sampling technique in selecting participants. Hence, the findings of the study cannot be easily generalised to the whole population of fuel station attendants in the country.

### **Directions for Future Research**

Although the current study makes useful contributions to literature and occupational health psychology, future studies should consider involving fuel station attendants in other parts of the country. It is necessary to focus on these group of fuel attendants in order to assess their own situation. It will help in determining the similarities and differences among them and fuel station attendants in the current study in terms of safety climate and safety behaviour.

Again, using a qualitative approach to probe further into safety climate and safety behaviour of fuel station attendants will be expedient. It will serve a means to listen to the narrative from a more subjective perspective. Using the qualitative approach will be instrumental in delving deeper into aspects of safety left unanswered or unattended to by the quantitative approach. Future studies should consider investigating other antecedents of safety behaviour. To provide better understanding and promotion of safety behaviour, it is crucial to discover various factors which may affect it, apart from safety climate. These may be personal or organisational factors. It is necessary to establish these links so as to reduce various occupational accidents in the downstream oil sector.

## **Conclusion**

The study focused on establishing the relationship between safety climate and safety behaviour. Using a quantitative approach, the study establishes a positive relationship between safety climate and safety behaviour. Further, proactive personality had a strong direct relationship with safety behaviour. The study was in line with the Workplace Safety Model which identified safety climate to influence safety behaviour. The findings of the study highlights the importance of safety in organisations. Of particular importance in positively influencing safety behaviour of fuel attendants is the creation of a safe work environment. Authorities, managers and other stakeholders must pay attention to the safety of the environment and safety protocols of fuel stations in Ghana. This will help promote positive safety climate and ensure the safety of fuel station attendants and communities.

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APPENDIX A

ETHICAL CLEARANCE



UNIVERSITY OF GHANA  
ETHICS COMMITTEE FOR THE HUMANITIES (ECH)

P. O. Box LG 74, Legon, Accra, Ghana

My Ref No .....

1st November, 2017

Ms. Sandra Awewonu Bakidamteh  
Department of Psychology  
University of Ghana  
Legon

Dear Ms. Bakidamteh,

**ECH 035/17-18: SAFETY CLIMATE AND SAFETY BEHAVIOUR OF FUEL STATION ATTENDANTS:  
THE MODERATING ROLE OF PROACTIVE PERSONALITY**

This is to advise you that the above reference study has been presented to the Ethics Committee for the Humanities for a full board review and the following actions taken subject to the conditions and explanation provided below:

Expiry Date:	31/05/18
On Agenda for:	Initial Submission
Date of Submission:	18/09/17
ECH Action:	Approved
Reporting:	Quarterly



Please accept my congratulations.

Yours Sincerely,

Rev. Prof. J. O. Y. Mante  
ECH Chair

CC: Dr. Maxwell Asumeng, Department of Psychology, University of Ghana.