# CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, ISLAMABAD



# Impact of Safety Climate on Safety Behavior in Projects with Mediating Role as Safety Attitude in Projects and Moderating Role as Specific Transformational Leadership

by

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*Dedicated to my great parents, amazing husband and lovely siblings for their endless support and care*

## CERTIFICATE OF APPROVAL

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# *Acknowledgements*

# *Abstract*

The aim of this study is develop a new framework in the project management era by identifying the impact of safety climate in projects on safety behavior in projects, and to explore the mediating effect of safety attitude in projects between safety climate and safety behavior in projects. Data were collected from 294 respondents from educational and engineering project-based organization of Pakistan. The study adopted analytical descriptive approach method from the scientific research methods. The results showed that safety climate in projects directly impact safety behavior in projects in addition to a strong correlation relationship between them. However, it is revealed through findings of the study that specific transformational leadership in projects does not moderate the relationship between safety climate in projects and safety attitude in projects. In the end, implications for the project managers and employees and future research directions are discussed.

**Keywords: Safety Climate in Projects, Safety Behavior in Projects, Safety Attitude in Projects, Specific Transformational Leadership in Projects.**

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# Abbreviations

| | |
|---|---|
| **DV** | Dependent Variable |
| **H** | Hypothesis |
| **IV** | Independent Variable |
| **PBT** | Planned Behavior heory |
| **SA** | Safety Attitude |
| **SB** | Safety Behavior |
| **SC** | Safety Climate |
| **SET** | Social Exchange Theory |
| **STL** | Specific Transformational Leadership |

# Chapter 1

# Introduction

## 1.1 Background of the Study

The term safety climate, a subset of organizational climate, is used to widely illustrate the perceived value an organization allocates on the safety and health of its employees (Schwatka, Hecker, & Goldenhar, 2016). Theses perceptions can be affected by the employee's attitudes and behaviors (Rundmo, 2000). Through the organizational policies, procedures, and practices (Kessler, Spector, Chang, & Parr, 2008).

Zohar (1980) stated that the term safety climate primarily used in the literature studies in 1980. When he measured the employee's beliefs of different forms of work safety in manufacturing framework (Dov, 2008).

Safety climate inside the organizations is becoming the main focus for working safely in projects (Koster, Stam, & Balk, 2011). Many researchers have illustrated safety climate as a contributor factor to system failure (Neal & Griffin, 2006). This resulted in increasing the attention on studying the role of multiple factors on the safety climate in projects (Barling, Loughlin, & Kelloway, 2002) including the work environment and management systems to determine the safety measures in the workplace (Hayes, Perander, Smecko, & Trask, 1998; Parker, Axtell, & Turner, 2001). According to Zohar (1980), safety climate is an employee perception regarding their work environment. Glendon and Stanton (2000), in their study

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on safety climate has stated that safety climate is derived from organizational climate (which is perceptions regarding the internal environment and climate of an organization) and it consists of employee perceptions about their workplace safety-related policies, practices and procedures. According to Burke, Sarpy, and Tesluk (2002), safety behaviors is an individual behavior which is exhibited by the employee for maintaining the environmental and employee health and safety. The literature on safety behavior has indicated that unsafe behavior is the main reason for accidents in a working place rather than a failure of machines (Holt & Lampl, 2005; Reason, 1995). Unsafe behavior occurs when team members put more value on short term goals of projects (Zohar, 2002; Behm, 2005).

Many studies have indicated the positive correlation between safety climate and safety behavior (Griffin & Neal, 2000), and that these both variables have negative relationship with accidents (Hayes et al., 1998). It means poor application of safety climate measures leads to increased amount of accidents (Hofmann & Stetzer, 1996; Neal & Griffin, 2000; Rundmo, 1992). Also many studies highlighted the importance of taking the safety climate measures into considerations while working inside the workplace (Nahrgang, Morgeson, & Hofmann, 2011). Researchers depicted the vital role of safety climate in all project phases (initiating, planning, execution and closure) (El-Gohary, Osman, & El-Diraby, 2006) regardless to which department does it belong (Bain, Mann, & Pirola-Merlo, 2001). Employee follow roles and regulation, perform work duties well, feel more obligated towards citizenship behavior in an organization that has a positive safety climate (Hon, Chan, & Yam, 2014).

Another aspect of this study will deal with safety attitude; Hannaford (1976) defines this term as "a readiness to respond effectively and safely, particularly in tension-producing situations". Many studies have actually shown that safety attitude is an essential influencer for safety behavior (Díaz & Cabrera, 1997). According to Aksorn and Hadikusumo (2008) SA has been considered as a significant outcome of safety climate in projects. The last variable of this research is specific transformational leadership (STL); it has been defined as the behaviors of leaders which increase the followers expected performance (Schaubroeck, Lam,

& Cha, 2007). Ideal safety climate focuses on management priority towards risk and hazards communication through modifying safety attitudes (Biggs, Sheahan, & Dingsdag, 2007). Similarly an ideal safety attitude is the one that enhances safety behavior and decreases the frequency of accidents. Whereas, some studies have also shown ideal safety attitude is influenced by management involvement and commitment towards employee safety.

Specific transformational leadership affects the critical subordinate attitude and project success. This includes management trust (Avolio, Bass, & Jung, 1999; Pillai, Schriesheim, & Williams, 1999) and work performance (Barling, Weber, & Kelloway, 1996). Transformational leadership predicts performance even when personality characteristics are controlled statistically (Judge & Bono, 2000).

Specific transformational leadership has a great influence on the employee's attitudes and behaviors towards safety (Clarke, 2013). Hence it will impact the overall safety climate of the projects (Smith, Eldridge, & DeJoy, 2016). Specific transformational leadership is the behaviors of leaders which inspire and change its followers in such a way that they perform more than expected for the best of the organization (Avolio, Walumbwa, & Weber, 2009). Barling et al. (2002) stated that actions of management influence employee's perception when leaders have a commitment towards safety then there are more chances that the employees will show the same attitude towards safety.

## 1.2 Gap Analysis

Safety climate has been studied as a robust guide for safety deliverables in different organizations and multiple countries (Zohar, 2010). Many factors were studied to clarify this relationship and direct the leader to translate the safety measures and methods well to the employees. However there are many factors affecting safety climate to be explored yet (Newaz, Davis, Jefferies, & Pillay, 2018). Researchers have concentrated on studying the impact of safety climate on safety behavior in projects along with other mediators and moderators (Cooper & Phillips, 2004). According to Zohar (2000), safety behavior in projects and safety attitude in

projects are important variables to be studied with safety climate variable. Latest research works establish that safety climate positively influence safety behavior in projects (Newaz et al., 2018). In this study we will explore the moderating function of specific transformational leadership in projects among the variables; safety climate and safety attitude in projects, as it hasn't been studied yet in the previous researches.

Pakistan being considered a developed country with the rapid growth of projects nowadays in private and governmental sectors, however, still there is lack of expertise and development for the effective application of safety rules and regulations in these firms (Mohamed, Ali, & Quresh, 2006) that is why studying safety climate has become a common topic (Griffin & Neal, 2000)(Griffin, 2002). This is due to the awareness of researchers in the field of management and psychology of safety climate and its consequences, which are reflected in the project's safety behavior within the organization (Jackson, Joshi, & Erhardt, 2003).

Taking the previous findings into considerations, no study has been conducted on these variables; studying the mediating role of safety attitude in projects among safety climate in projects and safety behavior in projects; also the moderating function of specific transformational leadership among safety climate in projects and safety attitude in projects in Pakistani context; as a result this study will contribute significantly in literature especially for the project based organizations in Pakistan. And for the projects which are concerned with safety measures in the working place and employee's safety behaviors.

## 1.3    Problem Statement

Safety climate has become important bond to connect all the safety measures inside the projects. It plays potential role to provide inquiry or change the systems before failure. Extensive literature has been established highlighting increased need and interest of researchers in this area. However several variables correlated with safety climate are still not explored. In Pakistani context, achieving the successful deliverables in the projects is considered a big challenge and requires

massive efforts from an expert manager and skilled team working under safe environment. This is only possible once the leader has full awareness regarding the project management roles and techniques to apply them effectively to motivate the projects employees through the better understandings of their behaviors and attitudes. This leader-employee relationship will help to achieve the successful results of the project up to the required level of standards.

Taking safety attitude in projects a mediator to link the relation among the variables; safety climate and safety behavior in projects is a grey area. Also moderating function of specific transformational leadership for the variables; safety climate and safety attitude in projects is still not explored. To provide evidence in this area, particularly safety climate, safety behavior, safety attitude and specific transformational leadership, is the essential goal of this research since this will provide satisfying fundamentals for the projects to deal with safety climate to utilize them in better way.

## 1.4 Research Questions

Taking the previous introduction into considerations, the current study is aimed to find answers for many questions, some of these questions are as follow;

**Research Question 1**

What is the importance of safety climate in projects?

**Research Question 2**

What is the impact of safety climate on safety behavior in projects?

**Research Question 3**

What is safety attitude? And under which circumstances does safety attitude get affected in projects?

**Research Question 4**

Does safety attitude in projects play a mediating role in the relation of safety climate and safety behavior?

**Research Question 5**

Does specific transformational leadership play a role of moderator among safety climate and safety attitude in projects?

**Research Question 6**

Does safety climate play role in successful delivery of projects?

**Research Question 7**

Are safety behaviors, safety attitude and specific transformational leadership; important factors of safety climate?

## 1.5   Research Objectives

The long-term objective of this study is to create and test anticipated model to explore the relationship between safety climate in projects, safety behavior in projects and safety attitude in projects. Additionally specific transformational leadership in projects is added as the proposed moderator for the relationship between safety climate in projects and safety attitude in projects) The specific objectives of the study are stated below:

**Research Objective 1**

To find the correlation among safety climate and safety behavior in projects.

**Research Objective 2**

To find the relation among the variables; safety climate and safety behavior in projects with safety attitude in projects acting as a mediator.

**Research Objective 3**

To analyze the moderating function of specific transformational leadership on the relationship of safety climate and safety attitude.

**Research Objective 4**

To test analytically and establish the proposed relationships in the developmental projects of Pakistan.

## 1.6    Significance of the Study

Minor mistakes can cost the projects great losses especially in the initial phases of planning and launching the project. This scientific study will highlight the important rules to avoid risks which affect safety in projects. This will also develop clear understanding of the definition of safety climate and some common factors which influence It; to be explored more widely to help aid the project management techniques safely to achieve the required goals and deliverables of the projects.

The study will not only be helpful in adding more theoretical content to project management but also giving concrete evidence that how safety climate affect safety behavior and reflect the safety attitudes to contribute as an early warning tool of the future safety system failure in project based organizations.

The study also will clarify the link among safety climate and safety behavior in projects and will test the mediating effect of safety attitude in projects between safety climate and safety behavior. This research will explore the moderating function of specific transformational leadership among safety climate and safety attitude in projects.

It will also help the developmental sector of Pakistan to understand the significance of utilizing safety climate and safety behavior perceptions in projects effectively. Since the developmental corporate sector of Pakistan is growing rapidly day by day, and many international projects are being under process currently due to the new governmental activities with the foreign countries like Japan, China, Korea and Kuwait etc. Hence, showing the modern technical application of project management under safe and comfortable environment is a great challenge, to keep the best image about the country and the working style inside the projects, to attract the leading companies of the foreign countries to invest in our country's projects. This in turn will generate more revenue and improve the bad image shared by the media regarding the safety environment of Pakistan.

## 1.7 Theoretical Support

Multiple theoretical perspectives have been illustrated globally by different researchers which are used to explain the studies related to the leader-member relationship but social exchange theory can cover all the proposed variables of this research which are: Safety climate; Safety attitude in projects; Safety Behavior in Projects; Specific Transformational Leadership in projects. As well as Planned Behavior Theory is also being supported theory to our study.

### 1.7.1 Social Exchange Theory

Social exchange theory (SET) states that human relationships and social behavior are established in an exchange process. In any relationship, people measure the risks and rewards. When relationships become too unsafe for people, they decide to disconnect them altogether (Robbins, 2011). According to a recent study, SET is also suitable for the workplace and considered as one of the most dominant conceptual model in safety climate of organizations; as it is related to the presence of risk-free environment, considered a major antecedent of safety behavior (Hofmann, Morgeson, & Gerras, 2003).

This present study is using SET as a fundamental theoretical focus; to explain the relation among safety climate and safety behavior in projects. Social exchange theory states that outcomes are based on a combination of parties' efforts and mutual and reciprocal arrangements; Safety climate has a vital role in the creation of safety behavior; through its influence on safety attitude (Zohar, 2002). Developing a safety climate workplace is the job of both manager as well as employee (Dollard & Bakker, 2010). Their effort should be directed not only to the provision of new safety resources and application of safety rules but also to the motivation of employees and freedom to report problems as ways to reinforce the scope of the employees to communicate and learn from each other (Leana III & Van Buren, 1999).

The findings of our research can advance our understandings to the framework through which safety climate in projects impact safety behavior in them along with the mediation of safety attitude.

### 1.7.2 Planned Behavior Theory (PBT)

The Planned Behavior Theory (PBT) is a theory which connects the persons behaviors with his beliefs. It illustrates the person's attitude toward his behavior are together shaping the person's behavioral intentions and actions. The study was proposed by Icek Ajzen; in order to edit the predictive power of reasoned action theory by adding perceived behavioral control. PBT has been implied to researches of relations within behavior, belief and attitude among different fields. One example of these fields is management which is our study concern.

According to Planned behavior theory of Ajzen (1991), the practical implications of safety climate highlight the course of actions that the organizations with the help of managers can follow to decrease the risk of injuries. Meanwhile, when supervisors have an attitude towards safety they influence employees and shape their safety behavior in projects. Which indicates the strong bond between safety climate and safety behavior with the mediator of safety attitude.

### 1.7.3 Behavioral Theory of Leadership

Behavioral theory of leadership is based on the belief that strong leader is self made (Malo, 2012). This theory focuses on the behaviors of leader; it is not concerned with their inner thoughts (Smith, Huang, Ho, & Chen, 2006). Leaders show consideration for individuals when they identify followers unique abilities and their needs, provide training and coaching so that follower may reach their full capabilities. Similarly, the idealized influence of leaders is a trust-based relation that happens when leaders show and adapt high morals and standards in their own behavior and try to become role models for their followers. When leaders encourage followers to share their thoughts on organizational issues, norms, encourage them to questions things and develop creativity in them, leaders exhibit

intellectual stimulation. Specific transformational leadership has a close relation to promoting safety in projects. Specific transformational leadership emphasizes project managers to become role models for their employees by following what is good and right instead of what is expected from them (Barling et al., 1996; Pillai et al., 1999).

# Chapter 2

# Literature Review

## 2.1 Safety Climate and Safety Behavior in Projects

The literature on organizational safety and health has identified many safety contributing factors. Among them, safety climate has received more attention from researchers. Safety climate is composed of employee perceptions towards organizational rules, practices and policies for the safety of their employees (Hofmann & Stetzer, 1996). Another study has defined safety climate as the perceptions of workers regarding safety (Mearns & Flin, 1995). According to Zohar (1980), safety climate is an employee perception regarding their work environment. Similarly, Glendon and Stanton (2000), in their study on safety climate has stated that safety climate is derived from organizational climate (which is perceptions regarding the internal environment and climate of an organization) and it consists of employee perceptions about their workplace safety-related policies, practices and procedures.

Past studies has shown safety climate as an organizational climate component (Glendon & Stanton, 2000; Neal & Griffin, 2000; Choudhry, Fang, & Lingard, 2009) as well as an organizational climate component (Guldenmund, 2000; Lee & Harrison, 2000; Fang, Chen, & Wong, 2006; O'Toole, 2002). Safety climate has been reflected as a useful tool for improving safety in projects (Zohar, 2010,

2003). Safety climate identifies management potential pitfalls that can cause serious injuries and accidents (Zohar, 2010). Researchers have determined three most common safety climate factors which include safety commitment, safety rules and regulation and workers involvement (Hon, Chan, & Yam, 2012; Dedobbeleer & Béland, 1991; Mohamed, 2002; Fang et al., 2006). Moreover Brown and Holmes (1986) have also determined safety climate factors which include organizational policies for providing safety tools, adequate training and effectiveness of safety systems and employee participation in workplace safety practices.

According to Burke et al. (2002), safety behaviors is an individual behavior which is exhibited by the employee for maintaining the environmental and employee health and safety. Safety behavior is composed of two types safety participation (which is usually done voluntarily) and safety compliance (which is mandatory) (Neal & Griffin, 2000; Christian, Bradley, Wallace, & Burke, 2009).Safety compliance consists of such task that employees should perform in order to confirm that the safety guidelines are being followed in the workplace like using protecting equipment. Whereas, safety participation consists of such factors that help in creating a safe environment, for example, attending safety meetings and helping coworkers.

The literature on safety behavior has indicated that unsafe behavior is the main reason for accidents in a working place rather than a failure of machines (Holt & Lampl, 2005; Reason, 1995). Unsafe behavior occurs when team members put more value on short term goals of projects (Zohar, 2002; Behm, 2005).Project managers have a major influence on employee safety behaviors (Johnson, 2007; Hardison, Behm, Hallowell, & Fonooni, 2014; Mohamed, 2002). Similarly, management support, management commitment with proper communication in projects is seen as a behavior-changing phenomenon (Gillen, Baltz, Gassel, Kirsch, & Vaccaro, 2002; Hsu, Lee, Wu, & Takano, 2010; Parker et al., 2001; Sampson, DeArmond, & Chen, 2014).

Employee follow roles and regulation, perform work duties well, feel more obligated towards citizenship behavior in an organization that has a positive safety climate (Hon et al., 2014). Safety climate has a vital role in maintaining workplace

safety and health by impacting employee safety behavior (Christian et al., 2009). Studies have shown that safety climate has an influence on safety behaviors in the presence of safety knowledge and motivation (Clarke, 2006; Hofmann et al., 2003; Zohar, 2000). According to Neal and Griffin (2006) safety climate through its influence on safety knowledge and safety motivation leads to positive safety behaviors. Griffin and Neal (2000), stated that safety motivation (when an employee willingly behaves safely) has a more strong relation with safety participation then safety knowledge. Whereas, safety knowledge has a more strong relation with safety compliance. Because when an employee has safety knowledge they know how to perform and behave safely by following emergency procedures, handling hazardous elements and tools, etc.

Safety climate shows employees the significance of health and safety in the organization when compared with other organizational goals (Zohar, 2010). Research has shown that when there is a positive safety climate in projects, there are fewer chances that team members will engage in any unsafe actions that can result in injuries and accidents (Martinez-Corcoles, Gracia, Tomas, & Peiro, 2011; Hofmann & Stetzer, 1996; Reason, 1990). When projects have positive safety climate there are less chances that team members will involve in unsafe behaviors.

Past researches have shown a significant association among safety climate and safety behaviors (Smith et al., 2006; Brown & Holmes, 1986; Gillen et al., 2002; Hofmann & Stetzer, 1996). Moreover, researches in construction, healthcare, oil drilling and machine manufacturing have also stated a direct impact safety climate have on safety behavior (Mearns, Whitaker, & Flin, 2003; Varonen & Mattila, 2000; Griffin & Neal, 2000). Which depicts that safety climate in projects also have a direct relation with project participant's safety behaviors (containing safety participation and safety compliance).

According to Planned behavior theory of Ajzen (1991), the practical implications of safety climate highlight the course of actions that the organizations with the help of managers can follow to decrease the risk of injuries. Meanwhile, when supervisors have an attitude towards safety they influence employees and shape their safety behavior in projects. Hence we can conclude that

*$H_1$: **Safety Climate has a significant and positive relationship with Safety Behavior in Projects.***

## 2.2 Safety Climate and Safety Attitude in Projects

According to Hannaford (1976), safety attitude is the willingness of an employee to respond safely and effectively in a tension producing situation. Lindgard and Rowlinson (2005) has defined safety attitudes as a tendency to react in a favorable or unfavorable way in a specific situation. Personal attitude is based on three components which are behavioral, cognitive and affective which reflect what an individual feel and do in a particular situation. Here affective component determines the values of a person and how they feel (emotional reaction) these emotional reactions can be based on the previous experience. Similarly, the cognitive component is reflected by individual experience, knowledge and beliefs. Whereas, behavioral component reflects the way through which the person behave and act in a situation.

Some researchers have indicated that safety attitudes are influenced by past experiences. Knowledge of accidents and the way they occur define attitudes towards them. Safety attitude define a person's sense of commitment and responsibility regarding safety. Safety attitude at the individual level reflect combination of emotions, policies, practices, procedures and beliefs related to safety (Henning et al., 2009; Rundmo & Hale, 2003). Similarly, safety attitudes at the organizational level shows shared employee perceptions regarding organizational safety practices, policies and procedures (Zohar, 2003; Dıaz & Cabrera, 1997). In short, it can be stated that the safety attitude in projects forms project level priorities towards safety over production and other project goals.

Safety attitudes have been studied in the past decades from different perspectives like Siu, Phillips, and Leung (2004) has determined the association between safety

attitudes with age and safety performance and concluded that older project employees are more motivated to establish a positive safety attitude as compared with young employees. Studies have shown that in a project or industrial unit having positive safety attitudes lead to more productions and less work-related accidents and injuries (Mearns & Flin, 1995; Cheyne, Tomás, Cox, & Oliver, 1999; Williamson, Feyer, Cairns, & Biancotti, 1997).

Numerous researches have determined a wide range of perceptions regarding safety climate relation with safety attitude in terms of management perceived safety practices, perceived level of risk and perception regarding priority of safety in the working place (Rundmo, 1992; Zohar, 1980; Hayes et al., 1998). Safety climate is reflected by the organizational culture. Whereas, safety attitudes are affected by both individual differences and the environment. Many studies have reflected safety attitude as a safety climate outcome (Harvey et al., 2002; Cheyne et al., 1999). When an organization has a positive safety climate it emphasis on recognition of potential risks and hazards. Safety climate that provides interventions to prevent accidents have a good safety performance and attitudes at individual level as compared to projects where employees do not have safety attitudes.

Pidgeon (1991) has discussed that safety climate contains three main elements a) positive safety attitudes b) rules and norms for handling risks and hazards effectively c) safety practices reflexivity. Cox and Cox (1991) indicated that safety attitude of employees in organizations has a significant association with safety climate. Similarly, Cheyne, Cox, Oliver, and Tomás (2007) have also defined safety attitudes as a significant safety climate outcome in projects. When projects have a positive safety climate their employees usually have positive attitudes towards safety.

$H_2$**: Safety Climate has a significant and positive relationship with safety Attitude in Projects.**

## 2.3 Safety Attitude in Projects and Safety Behavior in Projects

In the past decades, there has been considerable progress on safety attitude studies. When safety attitude was not even considered as an important safety behavior influencer (Eagly, 1992). Attitudes are not like personality they change according to the situation (Petty & Cacioppo, 1986). Literature has shown that positive attitudes lead to a positive motivation in an employee that change their behavior towards safety in projects. Cheyne et al. (1999) stated that workers attitudes, coworker and supervisor response towards safety and hazards predicts safety behavior in projects.

The literature on social psychology has determined the association between safety behavior and safety attitude in organizations. According to Ajzen (1991), an individual behavior is determined by their subjective norms and normative beliefs influenced by supervisors and coworkers. Employee attitude towards safety while performing workplace tasks are influenced by their safety knowledge and behavior. This safety behavior tends to repeat again and again. Biggs et al. (2007) have indicated that safety attitude has a strong role in defining safety behaviors. Workers safety attitude not only reflect whether they are behaving safely in projects or not. However, they also determine that formal and informal safety practices and instructions are being followed by them for achieving organizational safety goals (Loosemore & Malouf, 2019).

Donald and Canter (1994) argued that for understanding how the employee safety attitude leads to safety behaviors in projects, there is a need to understand their mental processes. Because unsafe actions in the working place are usually intentional. Whereas, attitudes are the key contributor in creating workers intentions towards safety practices (Ajzen, 1991). Furthermore, employee's attitudes are dependent on individual perceptions of risks. Studies have also shown that past knowledge and experience related to accidents and risks can reflect safety attitude of workers. Workers develop their safety attitude on the basis of perceived risks. After that workers can decide what to do on the basis of their intention. These

intentions change the actions and behaviors of workers towards their safety as well as the safety of their workplace.

In addition to knowledge of risk and accidents, there are some other components that can influence safety behavior which include reward and incentives given to the worker. Shin, Lee, Park, Moon, and Han (2014) define three aspects of safety attitude that lead to safety behavior in projects which involve the roles of individuals and organization (for example manager, supervisors and coworkers) in making strong safety climate, attitude of an individual towards safety, knowledge of past experiences and safety practices like wearing safety equipment's or clothes, attending meeting related to safety etc.

There are a great number of studies that have shown a positive connection among safety attitudes and safety behavior in organizations. For example, according to Cheyne et al. (1999) safety attitude can determine safety behavior in the workplace. In their study Rundmo (1996) has shown the impact of safety attitude on safety behaviors. Similarly, McGovern et al. (2000) have also found the same relation that safety attitudes determine safety behavior in terms of safety compliance and safety participation behaviors in the organizations. Thus past researches have proved that safety attitude in projects can enhance the capability of reducing accidents and risks by changing employee behavior towards safety.

Measuring safety attitudes in workplace can be a helpful tool in evaluating workplace safety performance (Glendon & Litherland, 2001). Hence if employees have more mature safety attitudes they look for the safer environment which decreases unsafe behaviors in projects. Project employees who have a positive safety attitude are less seen to experience work-related accidents. Studies have shown that knowledge about a topic plays an important role in making a positive attitude and attitude is reflected as the best component for predicting and changing individual behavior. That shows when employees have a positive safety attitude in projects they are most likely to have positive safety behavior in projects (Gharibi, Mortazavi, Jafari, Malakouti, & Abadi, 2016). Hence we can conclude that

$H_3$: **Safety Attitude in Projects has a significant and positive relationship with Safety Behavior in Projects.**

## 2.4 The Mediating Role of Safety Attitude in Projects between Safety Climate and Safety Behavior in Projects

In the past few years, many studies have stated the effect employee's safety climate have on workplace accidents and safety behaviors (Neal & Griffin, 2006; Siu et al., 2004; Varonen & Mattila, 2000). Some of them have determined a straight connection between organizational safety climate and safety behaviors (Glendon & Stanton, 2000; Cooper & Phillips, 2004). Whereas, some studies found that this relationship exists only in the presence of other mediating variables (Barling et al., 2002; Zohar & Luria, 2004). For example, safety climate in presence of coworker and supervisor safety interventions affect safety behavior which helps in preventing workplace accidents.

Similarly, another study found the same impact as when employee perceives that their organization care about their safety and wellbeing, it develop a positive safety attitude and safety obligation in them to carry out safety behavior (Behm, 2005). This study also proposes that attitude towards safety leads to a great motivation to safely perform workplace tasks. Having a positive safety climate in workplace where workers had favorable safety attitudes show less unsafe behaviors like using protective equipment's to eliminate injuries. Whereas, unfavorable safety attitudes lead to negative safety behavior in projects like feeling uncomfortable using personal protective devices.

Ideal safety climate focuses on management priority towards risk and hazards communication through modifying safety attitudes (Biggs et al., 2007). Similarly an ideal safety attitude is the one that enhances safety behavior and decreases the frequency of accidents. Whereas, some studies have also shown ideal safety attitude is influenced by management involvement and commitment towards employee safety. Manager behavior and attitude towards safety is also a contributor to employee safety behavior in projects.

Studies have shown that workplace accidents usually occur because of wrong individual perceptions towards risks. Which cause wrong decisions and unsafe behaviors in projects known as errors. Therefore for avoiding these errors and accidents management should focus on creating safety awareness (Rundmo & Hale, 2003). This finding has also been supported by Choudhry and Fang (2008), safety behavior is influenced by organizational psychological and economic factors, safety awareness, co-workers attitude and work pressure. The study of Khosravi et al. (2014) found that in the construction projects following factors have the most impact on unsafe behaviors which include individual characteristics, society, work-group, organization, site condition, project management and supervisor and contractor. Hofmann and Morgeson (1999) have stated that accidents can be prevented by a safety climate that supports effective communication.

According to (Seo, 2005) following factors has an impact on unsafe behavior in projects these are perceived barriers, safety climate, work pressure, hazard level and between them, safety climate was the most important that has the most impact on safety behavior. Moreover, another study finds that there are three paths that lead safety climate to unsafe behavior in projects which are the effect of perceptions regarding risk, barriers and work pressure. Study of Zhou, Fang, and Wang (2008) concluded that managerial factors have more influence on safety behavior then personal factors and safety attitude has an impact on safety behavior. Similarly group norms have also the direct link with unsafe behavior. Another Study of Fugas, Silva, and Meliá (2012) indicated that safety climate at organizational level impact on safety behavior is facilitated by safety attitude of workers and coworkers descriptive standards regarding safety (Mohammadfam, Ghasemi, Kalatpour, & Moghimbeigi, 2017).

Tomas and Oliver (1995) developed a framework for clarifying the impact of perceptions and attitudes on safety behavior and they concluded that perceptions regarding hazard environment and safety issues have a straight effect on self-reported safety behavior in projects. Employee safety attitude leads to safety behavior in terms of three factors individual safety actions, management safety actions and safety training quality, these three factors are indicators of safety climate. They

also find out that safety attitudes reflected by management safety actions have the strongest association with safety commitment which is the main safety indicator described in several studies.

Griffin and Neal (2000) determined safety climate effect on safety performance and concluded that safety climate is impacted by safety related knowledge and motivation. Another study has determined the method in which safety climate, safety attitude and safety behavior has an interaction with each other. The conclusion was that safety climate directly impacts safety attitude of employees which leads to safety behavior in organizations. Similarly, the study of (Vinodkumar & Bhasi, 2010) stated the influence of management factors on safety behavior and concluded that safety related knowledge and motivation are some important management factors that affect safety behavior. In another study by (Brown, Willis, & Prussia, 2000) determine the impact of personal factors, climate and social and technical factors on safety behavior and concluded that safety climate and personal safety factors effect safety efficacy and safety attitude.

$H_4$: *Safety Attitude in Projects mediates the relationship between Safety Climate and Safety Behavior in Projects.*

## 2.5 Moderating Role of Specific Transformational Leadership between Safety Climate and Safety Attitude in Projects

Specific transformational leadership has gained great attention in the literature on workplace safety (Avolio et al., 1999). Specific transformational leadership is the behaviors of leaders which inspire and change its followers in such a way that they perform more than expected for the best of the organization (Avolio et al., 2009). Specific transformational leadership has four type's inspirational motivation, individual consideration, idealized influence and intellectual stimulation (Barling et al., 2002; Bass, 1985).

Leaders show consideration for individuals when they identify followers unique abilities and their needs, provide training and coaching so that follower may reach their full capabilities. Similarly, the idealized influence of leaders is a trust-based relation that happens when leaders show and adapt high morals and standards in their own behavior and try to become role models for their followers. When leaders encourage followers to share their thoughts on organizational issues, norms, encourage them to questions things and develop creativity in them, leaders exhibit intellectual stimulation. Whereas, inspirational motivation is a process that occurs when leaders promote communication and help employees in creating a clear and positive vision for their future and challenge employees so that they can go beyond their comfort zone and self-interest (Kapp, 2012; Hoffmeister et al., 2014).

Specific transformational leadership has a close relation to promoting safety in projects. Specific transformational leadership emphasizes project managers to become role models for their employees by following what is good and right instead of what is expected from them (Barling et al., 1996; Pillai et al., 1999). Among other leadership styles, a large number of researches supports the association between perceived safety climate and specific transformational leadership (Bass, 1985; Clarke, 2013). Whereas, studies have also shown that specific transformational leadership has an important influence on workers safety performance attitudes (Navon, Naveh, & Stern, 2005; Nahrgang, Morgeson, & Hofmann, 2007; Hofmann et al., 2003; Clarke, 2013).

According to Clarke (2013), both leadership styles transactional and transformational leadership had a significant impact on employee safety compliance and safety participation. However, some studies have also stated specific transformational leadership strong association with safety participation of employees. In their study Christian et al. (2009) has also find the same impact of leadership on employee safety participation. The association between safety attitude and specific transformational leadership has also been examined. For example, a study has shown that when leader interacts with the employees in projects, employee observe leaders attitude and behaviors, reflecting their priority on safety, that observation generates employee safety attitude (Zohar, 2008).

When leader possesses specific transformational leadership characteristics, communicate their safety priorities through daily meetings, the perceptions of employee regarding safety climate enhances (Zohar & Polachek, 2014; Hoffmeister et al., 2014; Katz-Navon, Naveh, & Stern, 2005). Specific transformational leadership impact safety climate at organizational level (i.e. collective perceptions regarding safety practices, rules and procedures) in such a way that specific transformational leadership style of a leader eliminate the negative impact of safety climate on employees (Zohar, 2010). Previous researches have shown that leaders having a strong and positive focus towards safety practices enhances employee attitude towards safety in projects.

Results from a study have stated the association between perceived employee safety climate and attitudes become strong when leaders have safety-specific transformational leadership style (Smith et al., 2016). Specific transformational leadership develops a positive modification in employee's perceptions when leaders show a strong and engaging safety vision, communicate that vision by defining the ways to achieve it, empowering others to gain goals, leading by example and motivate employees. Studies on safety leadership found specific transformational leadership to have more influence on safety outcomes (Kelloway, Mullen, & Francis, 2006; Barling et al., 2002; Clarke, 2006; Mullen, Kelloway, & Teed, 2011). Moreover, literature has also shown some evidence on the negative impact specific transformational leadership have on injury and accidents (Zohar, 2002; Pilbeam, Doherty, Davidson, & Denyer, 2016; Mullen & Kelloway, 2009; Schwarz, Hasson, & Tafvelin, 2015).

Barling et al. (2002) stated that actions of management influence employee's perception when leaders have a commitment towards safety then there are more chances that the employees will show the same attitude towards safety. Safety-specific transformational leadership has an influence on workers attitudes and safety outcomes. So, we conclude that

$H_5$*: Specific Transformational Leadership moderates the relationship between Safety Climate and Safety Attitude in Projects such that it strengthens the relationship.*
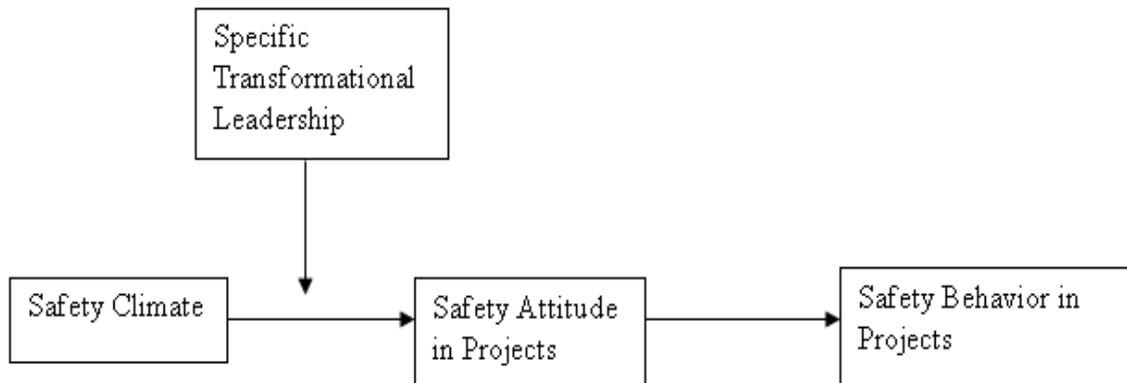
FIGURE 2.1: Research Model

## 2.6 Research Hypotheses

**H₁**: *Safety climate has a significant and positive relationship with safety behavior in projects.*

**H₂**: *Safety climate has a significant and positive relationship with safety attitude in projects.*

**H₃**: *Safety attitude in projects has a significant and positive relationship with safety behavior in projects.*

**H₄**: *Safety attitude in projects mediates the relationship between safety climate and safety behavior in projects.*

**H₅**: *Safety specific transformational leadership moderates the relationship between safety climate and safety attitude in projects such that it strengthens the relationship.*

# Chapter 3

# Research Methodology

This chapter contains of all the approaches and procedures including population, sample attributes level of analysis, data analysis tools, units of analysis, study design, instruments and their reliabilities.

## 3.1 Research Design

The research design explains the required data, suitable methods for data collection and analysis; in order to deliver a scheme aimed to respond to the research questions. The data and methods applied in analysis must take into considerations the practical and theoretical constraints of the study to enhance effectiveness of study and achieve reliability in results (Shenton, 2004). Quantitative research approach used in this study as it is considered from the recent researchers as the most reliable and valid method to deliver the results due to which it takes it nto account type and strength of relationships (Golafshani, 2003).

## 3.2 Nature of Study

This present study is conducted to highlight the effect of safety climate in projects on safety behavior in projects with the mediation of safety attitude in projects and moderation of specific transformational leadership. The cp-relational study is

used in this research that explains the association of variables. Different project based organizations as well as governmental organizations of Pakistan were targeted to obtain the relevant data leading to desired results. Initially, around 350 questionnaires were distributed to collect data but only 300 were returned; out of these returned questionnaires, only 294 certain questionnaires were collected. The approved sample is simulated to be a representative of the entire Pakistani population so that we can generalize the results.

### 3.2.1    Research Philosophy

This study is based on hypothetical deductive research method; this theory is created in the 1960s by American sociologists Glaser and Strauss (Connell & Lowe, 1997). It is an approach in research that starts with a theory about each variable and their correlations then derive testable hypotheses from them (Bilsky & Schwartz, 1994). The hypotheses are then tested by gathering and analyzing data using SPSS software, then theory is either supported or contradicted by the results (Gray, 2013).

### 3.2.2    Qualitative Method

Qualitative research is a scientific method of investigations to gather non-analytical data (Wang, Ding, & Hou, 2008). This type of research "refers to the concepts, meanings, definitions, characteristics, description and symbols of things". Qualitative research explains why and how a certain phenomenon may occur. Qualitative research approaches are employed among many academic disciplines, focusing specially on the human elements of the social sciences (Jorgensen, 2015).

### 3.2.3    Quantitative Research

Quantitative Research is used to quantify the problem by way of generating numerical data or data that can be transformed into usable statistics (Swan, 2013). It is used to quantify attitudes, opinions, behaviors, and other defined variables and

generalize results from a larger sample population (Albarracin, Johnson, Fishbein, & Muellerleile, 2001). Quantitative Research uses measurable data to formulate facts and uncover patterns in research. Quantitative data collection methods are much more structured than Qualitative data collection methods (Pope, Ziebland, & Mays, 2000). Quantitative data collection methods include various forms of surveys online surveys, paper surveys, mobile surveys and kiosk surveys, face-to-face interviews, telephone interviews, longitudinal studies, website interceptors, online polls, and systematic observations (Vogt, 2007).

Since a large scale of population is targeted, mostly quantitative method is suggested used and preferred. Hence, in this research quantitative research has been used in order to collect the quality data for the purpose of correlating variables to each other and for demonstrating the nature of relationship between the variables used in the research.

### 3.2.4 Unit and Level of Analysis

Unit of analysis is considered as one of the most powerful element of researches. In this study unit of analysis comprises of organizations, cultures and individuals to groups. Since the significance of this study is "one to one" relationship between leaders and employees in projects, therefore, level of research is dyadic. So, leaders and employees in projects were the unit of this research, to evaluate the impact of safety climate on safety behavior in projects; as well as its impact on specific transformational leadership. It was important to reach the specific organizations which may have individuals with safety behavior under the role of leadership.

## 3.3 Population and Sample

Since the present study seeks to focus on both governmental and private sectors in Pakistan. Population for data collection includes different employees and managers in project based organizations. Data for this study were obtained from

7 project based organizations and governmental organizations in Lahore and Islamabad. Both national and international level project based organizations were included, running various projects like real estate, construction, marketing, research and development, education etc. there were around 25 projects under these organizations and the data were collected from the project's employees and their leaders.

## 3.4   Sample and Sampling Techniques

Sampling is used such that a specific group of people is selected from population as true representative to overcome the problem of inability to collect data from the entire population. Sampling is the most common way to collect data without wasting time and resources.

The number of project employees and their leaders approached for data collection was around 350; however, only 294 genuine responses were received both on safety climate; and safety behavior in projects. For reporting purposes, the data from both project's leaders and project's employees were merged as averages, to avoid the threat of common method variance. Self reported questionnaires were used for data collection from employees.

The respondents of the current study were ensured their invisibility and that their information would be completely used only for research purposes. Due to some limitations reaching population and for time saving, convenience sampling technique was applied in current study. It is a part of non-probability sampling method. This involves random data collection based on the feasibility to effectively collect data. Usually for the data which is collected randomly from project-based organizations in Pakistan, its preferred to use convenience sampling.

# 3.5 Data Collection in Three-Time Lags

In our study, seven different organizations working in different projects in Lahore and Islamabad were included as the population and data were collected in three-time lags. This type of research is challenging; because data collection was carried in three-time lags from the same group of people. The time lag means the time intervals between the first and the next data collection survey. The time interval was 3 weeks in our research.

**Time Lag 1- T1:** in time lag 1, independent variable, safety climate, in projects and specific transformational leadership in projects, is the moderator variable was measured.

**Time Lag 2- T2:** In time lag 2, the mediator, safety attitude, in projects was measured.

**Time Lag 3-T3:** the dependent variable safety behavior in projects was measured at time lag 3.

In first survey, safety climate in projects and specific transformational leadership in projects were assessed. The part of questionnaire with items on safety climate was filled by the project's employees while specific transformational leadership in projects was filled by the project's leader. After 3 weeks of first survey completion, project's employees from the same group of respondents were requested to fill the questions of the mediator variable which is safety attitude. Following that with 3 weeks after the completion of second survey, at time 3 the questionnaire was again given to the employees to fill the items of safety behavior, which is the dependent variable. So it took almost 9 weeks for the completion of data gathering starting from December 2018 to February 2019. Also this time lag was challenging to reach the same group of respondents. Yet it helped to avoid the maximum errors in data collection. On the whole about 350 questionnaires were distributed among the same group of respondents but in the end 294 questionnaires were selected for the data analysis. The response rate was 84%.

## 3.6    Sample Characteristics

Sample characteristics or demographics of this research include: gender, age, qual-ifications and experience of the respondents. These characteristics were used due to their likelihood impact on safety climate in projects which is the independent variable of this study, and safety behavior in projects which is the dependent vari-able in this research. As mentioned before in this chapter, this is a dyadic study, which used questionnaire in two different parts, one part was filled by the project employee and the other part was filled by the project leader. Sample characteristics details are explained below:

### 3.6.0.1    Gender

Gender is considered as a key demographic for many reasons. It is not only highlights the importance of gender equality but also differentiate the female and male ratio in the given population sample. We aimed to achieve gender equality in our research and results but little difference was depicted in the ratio of female to male, showing more number of female than male.

TABLE 3.1: Gender Distribution

| Gender | Frequency | Percent |
|--------|-----------|---------|
| **Male** | 136 | 46.4 |
| **Female** | 156 | 53.2 |
| **Total** | 293 | 100 |

Table 3.1 shows 53.2% of the answerers are female and 46.4% are male.

### 3.6.0.2    Age

Age is normally considered as a control variable, analysis is done carefully in order to create age groups to discover the necessary variations which should be taken into account. Demographics are used to check their impact on our testing.

TABLE 3.2: Age Distribution

| Age | Frequency | Percent |
|---|---|---|
| **18-25** | 258 | 88.1 |
| **26-33** | 19 | 6.5 |
| **34-41** | 15 | 5.1 |
| **42-60** | 1 | .3 |
| **Total** | 293 | 100.0 |

Table 3.2 shows that 88.1% of the answerers have the age range of 18 to 25 years, 6.5% have the age from 26 to 33 years and 5.1% of them have age between 34 to 41years. Whereas, only 0.3% have age 42 to 60 years.

### 3.6.0.3   Qualification

Qualification of the respondents is also considered as a vital element of the demographics of this research as education is important to facilitate the employees to understand the importance of maintaining positive interpersonal relationships.

TABLE 3.3: Qualification Distribution

| Qualification | Frequency | Percent |
|---|---|---|
| **Bachelors** | 264 | 90.1 |
| **Masters** | 20 | 6.8 |
| **Mphil and Above** | 9 | 3.1 |
| **Total** | 293 | 100 |

Table 3.3 shows that from 293 respondents 90.1% of the respondents have the qualification of bachelors, 6.8% have qualification of masters, whereas, only 3.1% have a qualification of Mphil.

### 3.6.0.4 Experience

Experience is used as demographic variable which is considered as major factor that will effect and predict the information resources for the individuals. Multiple ranges are being used in this research so that data will be smoothly gathered for definite terms of respondents hired in multiple organizations.

TABLE 3.4: Experience Distribution

| Experience | Frequency | Percent |
|------------|-----------|---------|
| **0-5** | 240 | 81.9 |
| **6-10** | 21 | 7.2 |
| **10-15** | 21 | 7.2 |
| **16-20** | 10 | 3.4 |
| **Total** | 293 | 100 |

Table 3.4 shows that 81.9% of the respondents have 0-5 years of experience, 7.2% of the respondents have 6-10 years of experience, 7.2% of the populations have 11-15 years of the experience and 3.4% of the respondents have 16-20 years of experience.

## 3.7 Control Variable

Control variables used in this study were gender, age; qualification and experience. These variables were supposed to have some impact on the dependent variables (Safety attitude in projects and Safety behavior in projects). To check their effect one-way ANOVA is performed. The results were showing that none of the variable of this study is controllable ($p > 0.05$).

TABLE 3.5: Control variables

| Variables | Safety Attitude in Projects | | Safety Behavior in Projects | |
|---|---|---|---|---|
| | **F Value** | **Sig.** | **F Value** | **Sig.** |
| **Gender** | .029 | .971 | 1.118 | .328 |
| **Age** | .103 | .958 | 1.237 | .321 |
| **Experience** | 1.247 | .291 | 1.246 | .243 |
| **Qualification** | 1.417 | .244 | 1.930 | .147 |

Table 3.5 shows that Gender has no impact on all dependent variables including Safety Attitude in Projects (F = 0.029, p = 0.971) and Safety Behavior in Projects (F= 1.118, p= 0.328).

Similarly, Age has no impact on all dependent variables including Safety Attitude in Projects (F = 0.103, p = 0.958) and Safety Behavior in Projects (F= 1.237, p = 0.321). Experience also has no impact on Safety Attitude in Projects (F = 1.247, p = 0.291) and Safety Behavior in Projects (F= 1.247, p = 0.243) and Qualification has no impact on Safety Attitude in Projects (F = 1.417, p = 0.244) and Safety Behavior in Projects (F= 1.930, p = 0.147).

## 3.8 Instrumentation

### 3.8.1 Measures

Data was collected for this study through surveys which were filled by different employees working in projects. The questionnaire primarily is divided into 2 parts then it was gathered to be one to analyze the data using software. One part of the questionnaire contains the four demographics mentioned earlier along with the tow variables (safety climate and safety behavior in projects) and second part also

contains demographics as well as safety attitude variable and specific transformational leadership) One questionnaire resulted containing the four variables which are: safety climate, safety behavior in projects, safety attitude in projects and safety specific transformational leadership. During the survey phase of our study approximately 30 to 35 questionnaires were given to the respondents of each organization in each time. To increase the accuracy of our study online questionnaires were also shared in some websites beside the questionnaires which were to be filled by each respondent.

All the measures employed here use a 5-point Likert-scale; with 1= "strongly agree" to 5= "strongly disagree". Questionnaire also contained four demographic variables which contained information about the respondent's Gender, Age, Qualification and Experience.

Total 350 questionnaires were distributed and 294 were returned, these papers then were gathered and used for analyzing the results by SPSS software.

### 3.8.1.1 Safety Climate

It was measured by adopting 29-item scale validated and developed by (Gershon et al., 2000). "In my organization safety is as important as quality of the work and getting the work done on time" and "Those in charge of safety have the authority to make the changes they think are necessary" included in sample items. The responses will be obtained using a 5-point Likert-scale with 1= "strongly agree" to 5= "strongly disagree".

### 3.8.1.2 Safety Attitude in Projects

Safety attitude was measured by adopting 6-item scale. This scale was developed by (Ulinfun et al., 2002), and is adopted with specific focus to measure safety attitude in projects. The responses will be obtained using a 5-point Likert-scale with 1= "strongly agree" to 5= "strongly disagree" "Accidents prevention strategies can save money by reducing the number of accidents that need treatment"

and "Our organization probably increase current spending on accident prevention" included in sample items.

### 3.8.1.3 Safety Behavior in Projects

The scale developed by Hofmann et al. (2003) was used for 24 items on safety behavior in projects to maintain up-to-date knowledge of safety issues, and to initiate safety-related workplace change. "Getting involved in safety activities to help my crew work more safely" and "helping other crew members learn about safe work practices" are included in sample items. The responses will be obtained using a 5-point Likert-scale with 1= "strongly agree" to 5= "strongly disagree".

### 3.8.1.4 Specific Transformational Leadership

A four item scale was used to assess the moderating effect of specific transformational leadership in our study developed by (Bono & Anderson, 2005). The responses will be obtained using a 5-point Likert-scale with 1= "strongly agree" to 5= "strongly disagree". The items of the scale are "Talks to us about his or her most important values and beliefs" and "Articulates a compelling vision of the future".

TABLE 3.6: Instruments.

| No | Variable | Source | Items |
|----|----------|--------|-------|
| 1 | Safety Climate in Projects (IV) | (Gershon et al., 2000) | 28 |
| 2 | Safety Attitude in Projects (Med) | (Ulinfun et al., 2002) | 6 |
| 3 | Safety Behavior in Projects (DV) | (Hofmann et al., 2003) | 24 |
| 4 | Specific Transformational Leadership (Mod) | (Bono & Anderson, 2005) | 10 |

# 3.9 Statistical Tool

The relationship between safety climate (IV) and safety behavior (DV) single linear regression was used. Regression analysis is performed to study the impact of various factors on the DV to match between the provided data of literature of variables and their interrelation of the proposed model to check whether they support the acceptance or rejection of hypothesis.

Also Preacher and Hayes method was used for the mediation and moderation analysis. As it gives various models and different options to test the mediation and moderation; model 1 was performed for moderation analysis and model 4 was done for mediation analysis. These tow methods should be performed separately following these three common steps.

Step 1: The IV (Safety Climate) is put in the outcome column

Step 2: The DV (Safety Behavior) is put in the Independent Variable column

Step3: All demographics; (Age.Gender,Qualification and experience) are put in the covariant column.

IBM AMOS is used to test the measurement model. Multiple indices are to be used to analyze various models, these indices includes: (GFI, CFI and RMSEA). Each index value represent different results according to the author our study will be supporting.

For example for RMSEA value; our study followed the rule for the values ¡0.05 is taken as suitable value for perfect model (Schumacker and Lomax 2004).

## 3.9.1 Measurement Model

Confirmatory Factor Analysis is used to study the model of measurements consisting of four latent variables: safety climate, safety behavior, safety attitude and specific transformational leadership.

TABLE 3.7: CFA for complete model

| | $\chi^2$ | Df | CMIN DF | GFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|
| Initial Model | 4224.991 | 2204 | 1.917 | 0.702 | 0.829 | 0.828 | 0.056 |
| Modified Model | 3191.134 | 2080 | 1.534 | 0.803 | 0.897 | 0.916 | 0.043 |

*P>0
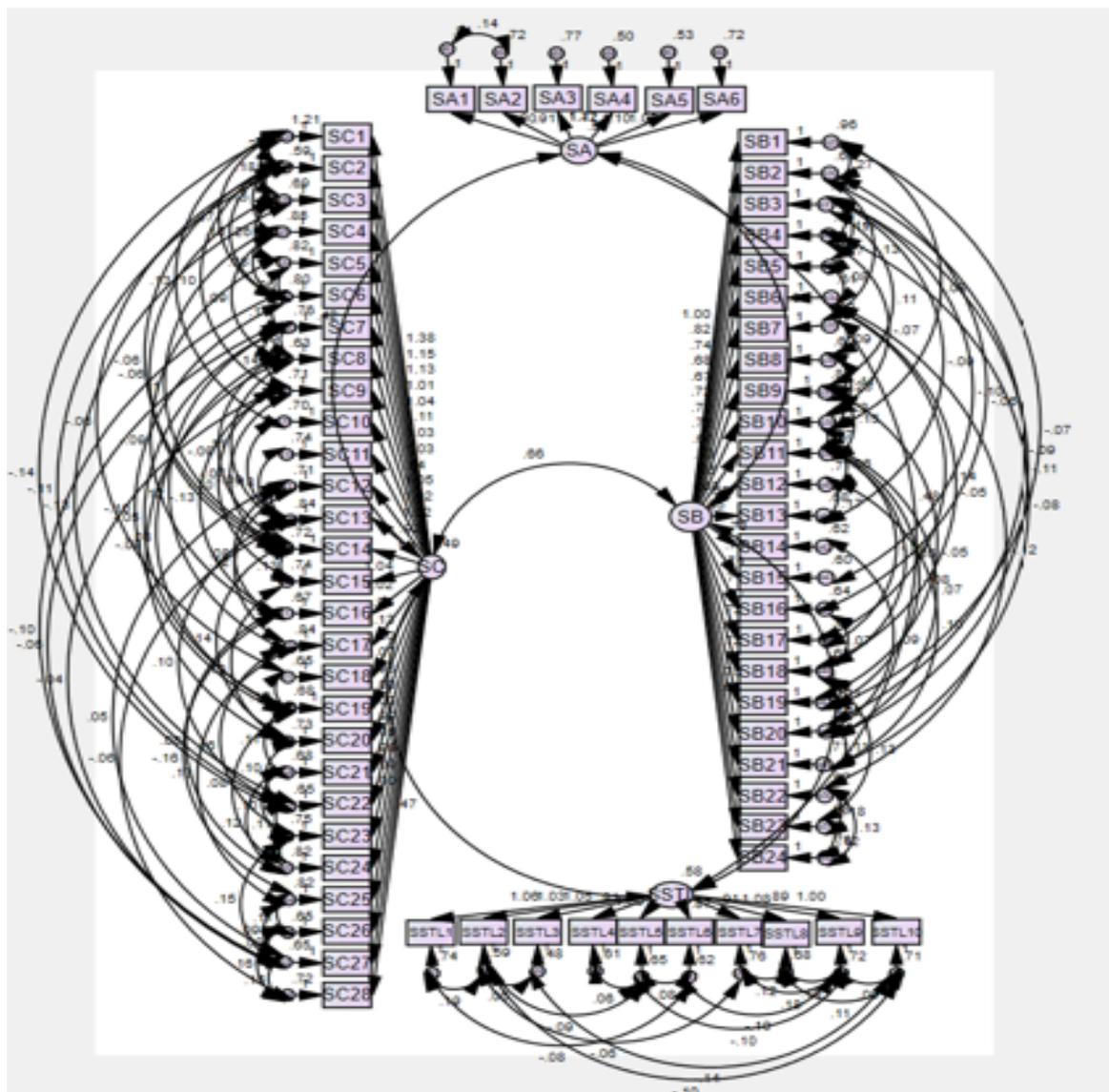


FIGURE 3.1: CFA for complete model

## 3.10    Pilot Testing

Before performing a test on a larger measure it is preferable to conduct pilot testing as it is a very effective and proactive approach to avoid many errors and risks related to wastage of resources and time. Hence, Pilot testing of approximately 30 questionnaires was performed to ensure whether the results are matching the research model or not. After conducting the pilot testing it was concluded that there was no significant issue in the variables and the used scales were reliable.

## 3.11    Reliability Analysis of Scales Used

Table 3.8: Scales Reliability.

| Variables | Cronbach's Alpha | Items |
| --- | --- | --- |
| **Safety Climate (IV)** | 0.844 | 28 |
| **Safety Attitude in Projects (Med)** | 0.758 | 6 |
| **Specific Transformational Leadership (DV)** | 0.797 | 10 |
| **Safety Behavior in Projects (Mod)** | 0.808 | 24 |

Table 3.8 shows that Cronbach alpha values for all the variables of this study are above 0.7 which is indicating that the scales used are reliable.

## 3.12    Data Analysis Techniques

Once the data collection process completed, 294 questionnaires out of 350 were finalized for testing and analysis purposes; the selected data was then analyzed and tested with the help of SPSS software version 20.1. these steps were followed to obtain the intended results:

1. All the appropriate and complete questionnaires were selected and gathered.

2. The variables and their related data were coded to be used for data analysis using SPSS software.

3. To explain the characteristics of sample, we used frequency tables.

4. Descriptive statistics conducted through using the numerical values of the variables.

5. Cronbach Alpha is used to test reliability.

6. Confirmatory Factor Analysis (CFA) was used to justify the measurement model.

7. Correlation analysis was performed to see the significant relationship between the variables.

8. Single linear regression analysis was performed to determine the relationship between Safety Climate (IV) and Safety Behavior (DV).

9. Preacher and Hayes process was used to conduct mediation analysis by using model 4 and moderation analysis by using model 1.

10. Preacher and Hayes method and correlation method were used for testing whether the proposed hypotheses of this study are accepted or rejected.

# Chapter 4

# Results

The results correlation and regression analysis are included in this chapter, these were performed to inspect the positive influence of Safety Climate on Safety Behavior in projects with the mediating role of Safety Attitude in projects and moderation of Specific transformational leadership.

## 4.1 Correlation Analysis

Correlation analysis determines the relationship among the variables of this study. Which involve the impact of safety climate on safety behavior in projects; the mediating function of safety attitude in projects and moderating effect of specific transformational leadership in projects. For this purpose Pearson Correlation analysis was used which has a range from -0.1 to 0.1. Correlation analysis clearly determines the strength and weakness in the variables relationships. Hence, 0 value shows no relation among the tested variables.

Similarly, if the value is not close to 0 then the relationship among tested variables is strong. Negative and Positive signs with correlation values shows relationship nature. When sign is positive, it shows that when one variable increases the other variable will increase, depicting direct relationship among them. Whereas, a negative sign shows that when one variable increases the other variable will decrease representing indirect relationship.

TABLE 4.1: Means, Standard Deviation, Correlation

| S.No | Variables | Mean | S.D | 1 | 2 | 3 | 4 |
|------|-----------|------|-----|---|---|---|---|
| **1** | Safety Climate | 3.56 | 0.76 | 1 | | | |
| **2** | Safety Behavior in Projects | 3.65 | 0.78 | .826** | 1 | | |
| **3** | Specific Transformational Leadership | 3.66 | 0.79 | .801** | .821** | 1 | |
| **4** | Safety Attitude in Projects | 3.62 | 0.89 | .696** | .707** | .712** | 1 |

*$P < 0.05$, **$p < 0.01$, ***$p < .001$ N=293 **Correlation is significant at the 0.01 level (2-tailed).

Table 4.1 shows that the mean value of Safety Climate is 3.56 and standard deviation is 0.76. The mean value of Safety Behavior in Projects is 3.65 and its standard deviation is 0.79 and mean value of Specific transformational Leadership is 3.66 and its standard deviation is 0.796. Whereas, mean value of Safety Attitude in projects is 3.62 and their standard deviation is 0.89.

Correlation Table 4.1 depicts that safety climate has a significant relationship with safety behavior in projects($r = .826**$ at $p < 0.01$). Safety Climate relationship with Specific transformational Leadership is also significant and positive ($r = .801**$ at $p < 0.01$). Moreover, Safety Climate relationship with Safety Attitude in Projects is also significant and positive ($r = .696**$ at $p < 0.01$). The relationship of Safety behavior in Projects and Specific Transformational Leadership is significant and positive ($r = .821**$ at $p < 0.01$). There is a significant relationship between Safety Behavior in Projects and Safety Attitude in projects where $r = 0.707**$ at $p < 0.01$. Moreover, there exists a positive and significant relationship among Specific Transformational Leadership and Safety Attitude in Projects ($r = .712**$ at $p < 0.01$).

## 4.2 Regression Analysis

Correlation analysis when performed in a study shows if there exists a relation between variables or not. Whereas, regression analysis shows the impact one variable has on the other variable and the verification of their reliance. Preacher and Hayes 2004 regression analysis method, for moderating variable (by applying model 1) and for mediating variables (by applying model 4) is used to check the moderating function of Specific Transformational Leadership as well as mediating impact of Safety Attitude in Projects.

**Hypothesis 1:** Safety Climate has direct positive relation with Safety behavior in Projects

TABLE 4.2: Simple Regression

| **Safety Behavior in Projects** | | | |
| --- | --- | --- | --- |
| **Predictor** | $\beta$ | $R^2$ | **Sig** |
| **Safety Climate** | 0.857*** | 0.683 | 0.000 |

*Un-standardized regression coefficient reported N=293, \*p<.01; \*\*p<.01; \*\*\*p<.001*

Table 4.2 shows the results of our first hypothesis: Safety Climate has direct positive relation with Safety behavior in Projects.

In this study, X denotes the independent variable i.e. Safety Climate and Y denotes the dependent variable i.e. Safety Behavior in projects. The illustrated form of unmediated model is shown below. Path 'C' shows the unmediated and direct link of independent and dependent variable.
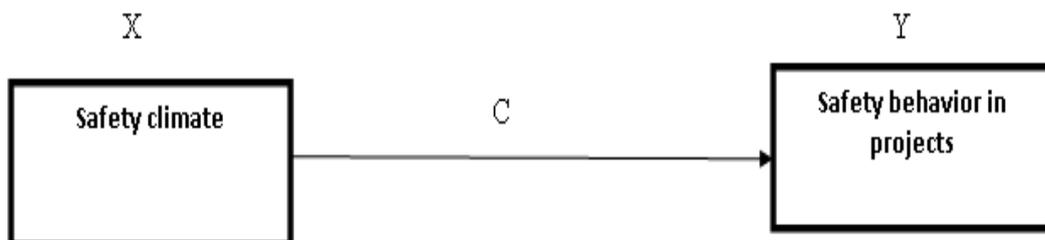


FIGURE 4.1: Linear Regression

**Hypothesis 2:** Safety Climate has direct positive relation with Safety attitudes in projects

TABLE 4.3: Simple Regression

| Predictor | $\beta$ | $R^2$ | Sig |
|---|---|---|---|
| | **Safety Attitude in Projects** | | |
| **Safety Climate** | 0.815*** | 0.484 | 0.000 |

*Un-standardized regression coefficient reported N=293, \*p<.01; \*\*p<.01; \*\*\*p<.001*

Hypothesis 2 states that safety climate is positively associated with safety attitude in projects. The results show a significant and positive relation between the two variables.
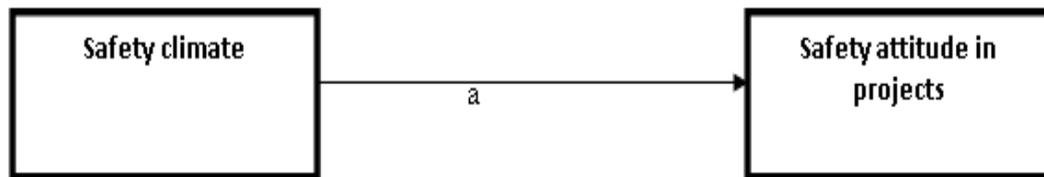


FIGURE 4.2: Hypothesis 2 illustrated representation

**Hypothesis 3:** Safety attitude in projects has direct positive relation with Safety behavior in projects

TABLE 4.4: Simple Regression

| Predictor | $\beta$ | $R^2$ | Sig |
|---|---|---|---|
| | **Safety Behavior in Projects** | | |
| **Safety Attitude in Projects** | 0.626*** | 0.500 | 0.000 |

*Un-standardized regression coefficient reported N=293, \*p<.01; \*\*p<.01; \*\*\*p<.001*

Hypothesis 3 states that Safety attitude in projects has direct positive relation with Safety behavior in projects.

These tables indicate that Safety Climate has a significant and positive relationship with Safety Behavior in projects. Which is proved by unstandardized regression coefficient results ($\beta$= 0.67, t= 14.90, P= .00). Therefore H1: Safety Climate has a positive and significant relationship with safety Behavior in projects is accepted. Similarly, H2: Safety Climate has a positive and significant relationship with safety Specific Transformational Leadership is also accepted based on unstandardized regression coefficient results ($\beta$= .38, t= 6.61, P= .00). H3: Safety Attitude in Projects has a positive and significant relationship with Safety Behavior in Projects is also accepted($\beta$=0.23, t= 5.89, P= .00).

The indirect effect of Safety Climate on Safety Behavior in Projects through Safety Attitude in projects has the upper limit 0.76 and lower limit 0.58. Which shows that it does not contain zero in the bootstrapped 95% confidence interval. That is why H4: Safety Attitude in Projects mediates the relationship between safety Climate and Safety Behavior in Projects is also accepted



FIGURE 4.3: Hypothesis 3 illustrated representation

## 4.3 Mediation Analysis

By performing mediation analysis, we will check our three hypotheses i.e.

H1 safety climate has direct and positive relation with safety behavior in projects. The other hypothesis which we will check in this analysis is safety attitude in projects has positive and direct relation with safety behavior in projects. Safety attitude in projects mediates between the safety climate and safety behavior in projects. So to check our hypothesis H2, H3 and H4, we utilized model 4 of Process macro by Hayes. The links between Independent variable to Mediator and mediator to dependent variable must be significant to prove mediation.
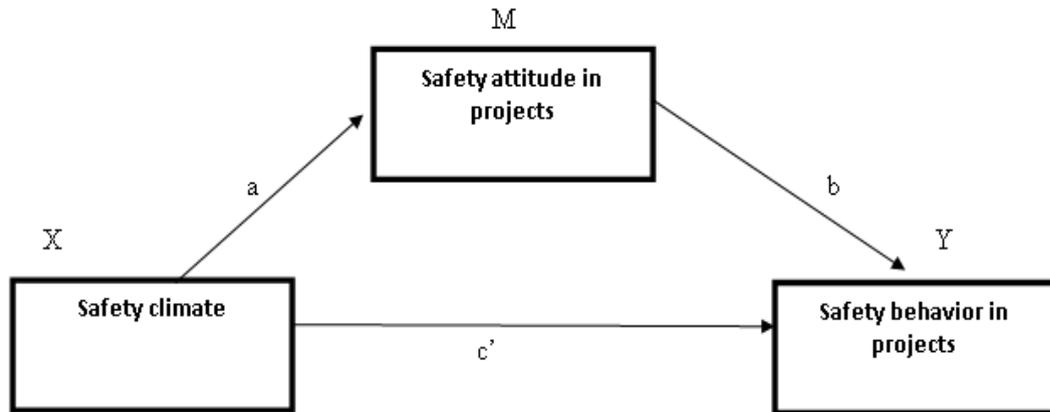
FIGURE 4.4: Mediation Analysis

TABLE 4.5: Mediation Analysis

| IV | Effect of IV on M (a path) | Effect of M on DV (b path) | Direct Effect of IV on DV (c' path) | Total Effect of IV on DV (c path) | Bootstrapping Results for Indirect Effect | |
|---|---|---|---|---|---|---|
| | $\beta$ | $\beta$ | $\beta$ | $\beta$ | LL95%CI | UL95%CI |
| **Safety Climate** | 0.815** | 0.226** | 0.672** | 0.184** | .1232 | .2671 |

*Note. Un-standardized regression coefficient indicated. Bootstrap sample size 5000. LL =lower limit; CI = confidence interval; UL = upper limit. N=293, \*P < .05; \*\*P <.01*
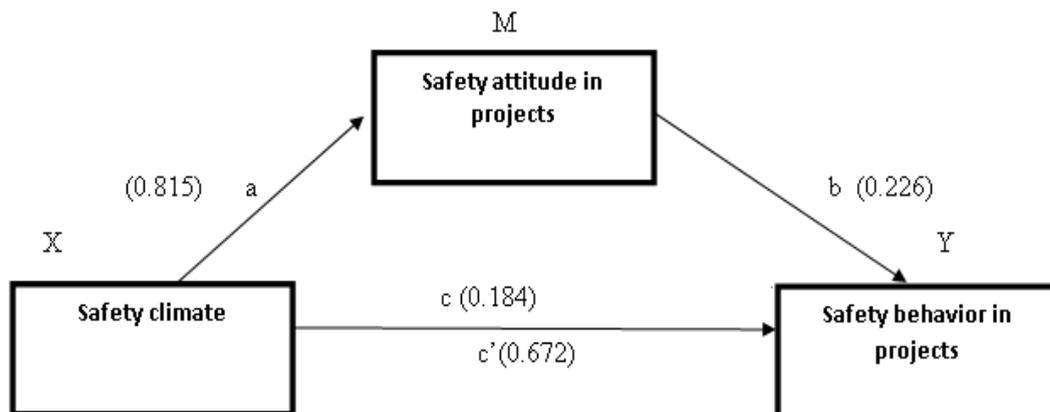


FIGURE 4.5: Mediation Analysis with coefficients

TABLE 4.6: Moderating Function of Safety Specific Transformational Leadership

|  |  |  | $\beta$ | $se$ | $t$ | $p$ |
|---|---|---|---|---|---|---|
| **Int_term** | $\rightarrow$ | **Safety Attitude in Projects** | -.013 | .05 | -.26 | .79 |

|  |  | **LL 95% CI** | **UL 95% CI** |
|---|---|---|---|
| **Bootstrap results for indirect effect** | | .79 | -.11 |

*Note. Un-standardized regression coefficient stated. Bootstrap sample size 5000. LL =lower limit; CI = confidence interval; UL = upper limit. N=293, \* P <.05; \*\* P <.01*

Table 4.6 depicts that Safety Specific Transformational leadership does not act as a moderator between Safety Climate and Safety Attitude in Projects ($\beta$=-0.013, $t$= -0.26, $p$= .79). Similarly, there is no 0 in the Upper and Lower limit of 95% of the confident interval (0.08, -0.011).Therefore Hypothesis 5 of the current study is rejected which depicts that there is a moderating impact of Safety Specific Transformational Leadership in the relationship between Safety Climate and Safety Attitude in Projects such that it strengthens the relationship.

## 4.4 Summary of Accepted/ Rejected Hypothesis

TABLE 4.7: Hypotheses Summarized Results.

| Hypothesis | Statements | Results |
|---|---|---|
| $H_1$ | Safety Climate has a significant and positive relationship with safety Behavior in projects. | **Accepted** |
| $H_2$ | Safety Climate has a significant and positive relationship with safety Specific Transformational Leadership. | **Accepted** |
| $H_3$ | Safety Attitude in Projects has a significant and positive relationship with Safety Behavior in | **Accepted** |

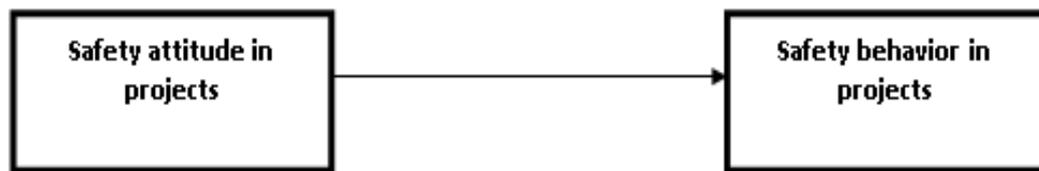| | | |
|---|---|---|
| | Projects. | |
| $H_4$ | Safety Attitude in Projects mediates the relationship between safety Climate and Safety Behavior in Projects. | **Accepted** |
| $H_5$ | Safety Specific Transformational Leadership moderates the relationship between Safety Climate and Safety Attitude in Projects such that it strengthens the relationship. | **Rejected** |

# Chapter 5

# Discussion and Conclusion

## 5.1 Discussion

This chapter covers the discussion related to major findings with the support of proposed model of the research. The chapter demonstrates results of hypothesis through proper references of the previous researches related to the purpose of the study. This discussion is followed by practical and theoretical significance, limitations, recommendations about safety climate and suggestions for the future researches. The discussion part concludes the general overview of this study.

The main emphasis of this study was to design a framework for connecting the variables safety climate in projects and safety behavior in projects, which are working in project-based organizations of Pakistan. Also our study concentrated on examining the mediating function of safety attitude in projects among safety climate in projects and safety behavior in projects; as well as attempts was done to examine the moderation effect of specific transformational leadership in projects'.

For this a hypothetical domain was established, on the basis of which, we hypothesized certain relationships between variables of our research. The results of our research illustrate the direct influence of safety climate in projects on safety behavior in projects, indicating that if safety climate measures are applied they positively affect the employee's safety behaviors towards the work; whereas, specific transformational leadership is directly influenced by Safety Climate in projects; also, a

positive relation between safety climate and safety attitude in projects. Likewise, in support of our claims, results have revealed that safety attitude and safety behavior in projects are positively affected. Similarly, the fourth hypothesis which declared safety attitude in Projects mediates the relation among safety climate and safety behavior in Projects. Therefore, our four hypotheses $H_1$, $H_2$, $H_3$ and $H_4$ of this study are accepted as shown in the results chapter, however specific transformational leadership in projects has been found with no moderating role between safety climate in projects and safety attitude in projects being termed as an insignificant moderator of the model because the relationship between two variables doesn't change in the existence of specific transformational leadership in projects. Each hypothesis is thoroughly discussed as below:

### 5.1.1 Hypothesis $H_1$: Safety Climate has a Significant and Positive Relationship with Safety Behavior in Projects.

This hypothesis signifies the positive influence of safety climate in projects on safety behavior in projects as testing results of this hypothesis shows significant relationship ($\beta$=.67, t= 14.90, $p$= .00).

Safety climate in projects has the t value of 13.90, which shows high significance level of the relationship. As the t value which is greater than 2 shows that the results are significant. Hence in this hypothesis the t value of 13.90 indicates statistically significant relation of safety climate in projects with safety behavior in them. And the $\beta$ co-efficient value is 0.67, this articulate that if there is a one unit change in safety climate in projects then there is a probability that safety behavior in projects would be increased by 67%.

Hence, the above-mentioned results are supported by previous literature. According to Christian et al. (2009), safety climate has an important function to maintaining organizational workplace safety through its impact on safety behavior. Studies have also indicated that safety climate influence safety behavior of workers inside

projects with the presence of safety knowledge and motivation (Clarke, 2006; Hofmann et al., 2003; Zohar, 2000). Neal and Griffin (2006) have stated that safety climate has a significant influence on safety knowledge and safety motivation which leads to safety behavior in projects. Research has shown that in the presence of a positive safety climate in projects, there are fewer chances that team members will engage in any unsafe actions that can result in injuries and accidents (Martinez-Corcoles et al., 2011; Hofmann & Stetzer, 1996; Reason, 1990). Projects which have a favorable safety climate are more possible to have less unsafe behaviors.

Past researches have shown a direct association among safety climate in projects and safety behaviors in projects (Brown & Holmes, 1986; Gillen et al., 2002; Hofmann & Stetzer, 1996; Smith et al., 2006). Results for the current study and past researches concluded that safety climate in projects has an important part in organizations for maintaining the safety of their employees. All the projects should maintain a positive safety climate which can influence the safety behavior of project participants. It has been studied that when projects have high safety climate, project participants are less likely to involve in risky behavior that leads to accidents.

### 5.1.2 Hypothesis $H_2$: Safety Climate has a Significant and Positive Relationship with Safety Attitude in Projects

This hypothesis signifies the positive relationship between safety climate in projects and safety attitude in projects. This hypothesis got accepted using SPSS testing ($\beta$=.81, t= 16.51, $p$= .00). The value of $\beta$ coefficient=0.81 which indicates that one unit change in safety climate in projects will bring 81% increase in safety attitude in projects. The value of t = 16.51 >2 indicates a statistically considerable association between safety climate in projects and safety attitude in projects. Hence literature has also supported the previously mentioned results regarding the positive and significant relationship between safety climate in projects and safety attitude in projects; such as (Zohar, 2003; Dıaz & Cabrera, 1997; Siu et al., 2004;

Mearns & Flin, 1995; Rundmo, 1992; Zohar, 1980; Hayes et al., 1998; Harvey et al., 2002; Cheyne et al., 1999; Cox & Cox, 1991; Cheyne et al., 2007).

Studies have revealed that in a project having a significant safety climate create positive safety attitudes of their employees that lead to more production and less work-related accidents and injuries (Mearns & Flin, 1995; Cheyne et al., 1999; Williamson et al., 1997). Great numbers of researches have determined a vast range of perceptions regarding safety climate relation with safety attitude in terms of management perceived safety practices, perceived level of risk and perception regarding priority of safety in the working place (Rundmo, 1992; Zohar, 1980; Hayes et al., 1998).

Numerous researches have determined a wide range of perceptions regarding safety climate relation with safety attitude in terms of management perceived safety practices, perceived level of risk and perception regarding priority of safety in the working place (Rundmo, 1992; Zohar, 1980; Hayes et al., 1998). Safety climate is reflected by the organizational culture. Whereas, safety attitudes are affected by both individual differences and the environment. Many studies have reflected safety attitude as a safety climate outcome (Harvey et al., 2002; Cheyne et al., 1999). When an organization has a positive safety climate it emphasis on recognition of potential risks and hazards. Safety climate that provides interventions to prevent accidents have a good safety performance and attitudes at individual level as compared to projects where employees do not have safety attitudes.

Pidgeon (1991) has discussed that safety climate contains three main elements a) positive safety attitudes b) rules and norms for handling risks and hazards effectively c) safety practices reflexivity. Cox and Cox (1991) indicated that safety attitude of employees in organizations has a significant association with safety climate. Similarly, Cheyne et al. (2007) have also defined safety attitudes as a significant safety climate outcome in projects. When projects have a positive safety climate their employees usually have positive attitudes towards safety.

Cheyne et al. (1999) have shown that safety attitudes in projects are one of the necessary outcomes of safety climate in projects that have a positive safety climate; their employees usually have good attitudes towards safety. When a project has

a positive safety climate it emphasizes on recognition of potential risks and hazards. Safety climate that provides interventions to prevent accidents has a good safety performance and attitudes at the individual level as compared to projects where employees do not have safety attitudes. Projects which emphasize more on creating a safe climate results in having positive attitudes of project participants towards safety. Safety attitude in projects not only helps in avoiding accidents and injuries, it also has positive attitudes towards safety lead project to a high level of production.

### 5.1.3 Hypothesis $H_3$: Safety Attitude in Projects has a Significant and Positive Relationship with Safety Behavior in Projects

Hypothesis $H_3$ signifies the direct correlation among safety attitude in projects and safety behavior in projects. This hypothesis was significant and accepted according to the results ($\beta$=.23, t= 5.89, $p$= .00). $\beta$ coefficient=0.23 indicates that one unit change in safety attitude in projects will bring 23% increase in safety behavior in projects. The value of t = 5.89 >2 indicates a statistically considerable association between safety attitude in projects and safety behavior in projects. Hence literature has also supported the previous mentioned results regarding the direct relation between safety attitude in projects and safety behavior in projects; such as (Cheyne et al., 1999; McGovern et al., 2000; Glendon & Litherland, 2001; Gharibi et al., 2016; Rundmo, 1996).

The acceptance of Hypothesis 3 is also supported by past studies. Literature has shown that safety attitudes in projects lead to a positive motivation in an employee that changes their behavior towards safety in projects (Cheyne et al., 1999). (Biggs et al., 2007) have also stated that safety attitude in projects has a powerful impact on safety behaviors in projects. In their study Shin et al. (2014) has defined three elements of safety attitude that lead to safety behavior in projects which involve the roles of individuals and organization for making strong safety climate, the

attitude of an individual towards safety, knowledge of past experiences and safety practices.

In addition to knowledge of risk and accidents, there are some other components that can influence safety behavior which include reward and incentives given to the worker. Shin et al. (2014) define three aspects of safety attitude that lead to safety behavior in projects which involve the roles of individuals and organization (for example manager, supervisors and coworkers) in making strong safety climate, attitude of an individual towards safety, knowledge of past experiences and safety practices like wearing safety equipment's or clothes, attending meeting related to safety etc.

There are a great number of studies that have shown a positive connection among safety attitudes and safety behavior in organizations. For example, according to Cheyne et al. (1999) safety attitude can determine safety behavior in the workplace. In their study Rundmo (1996) has shown the impact of safety attitude on safety behaviors. Similarly, McGovern et al. (2000) have also found the same relation that safety attitudes determine safety behavior in terms of safety compliance and safety participation behaviors in the organizations. Thus past researches have proved that safety attitude in projects can enhance the capability of reducing accidents and risks by changing employee behavior towards safety.

Past studies have shown a positive relation between safety attitude in projects and safety behavior in projects. In their study (Cheyne et al., 1999) have found a significant association among safety attitude in projects and safety behavior inside the workplace. Similarly, Rundmo (1996) has also shown the effect of safety attitude in projects on safety behaviors in projects. McGovern et al. (2000) have also found the same positive relation of safety attitudes and safety behavior in the workplace. Thus past studies have shown that safety attitude in projects can change project participants behavior towards safety.

### 5.1.4 Hypothesis $H_4$: Safety Attitude in Projects Mediates the Relationship Between Safety Climate in Projects and Safety Behavior in Projects.

Hypothesis $H_4$ assumed that safety attitude in projects mediates in the relation among safety climate and safety behavior in projects. The results generated for the current study are supporting this assumption. It is indicated through results that the indirect impact of safety climate on stated variables has the upper limit 0.76 and lower limit 0.58 representing that it doesn't contain (0) in the bootstrapped 95% confidence interval. Thus, results illustrated safety attitude in projects mediate the declared variables; safety climate in projects and safety behavior in projects; accepting the hypothesis.

The results of the present study are supported by the previous evidence from literature which created a bridge between safety climate in projects and safety behavior in projects through safety attitude in projects. According to Neal and Griffin (2006) the specified variables have an interaction with each other; where safety climate directly impacts safety attitude of employees which leads to safety behavior in organizations. Past studies have also shown that attitude towards safety leads to great motivation to safely perform workplace tasks. In the presence of a considerable safety climate where team members had favorable safety attitudes, show less unsafe behaviors in projects (Behm, 2005; Bronkhorst, Tummers, & Steijn, 2018; Neal & Griffin, 2006).

Studies have shown that workplace accidents usually occur because of wrong individual perceptions towards risks. Which cause wrong decisions and unsafe behaviors in projects known as errors. Therefore for avoiding these errors and accidents management should focus on creating safety awareness (Rundmo & Hale, 2003). This finding has also been supported by (Choudhry & Fang, 2008), safety behavior is influenced by organizational psychological and economic factors, safety awareness, co-workers attitude and work pressure. Griffin and Neal (2000) determined safety climate effect on safety performance and concluded that safety climate is impacted by safety related knowledge and motivation. Another study

has determined the method in which safety climate, safety attitude and safety behavior has an interaction with each other. The conclusion was that safety climate directly impacts safety attitude of employees which leads to safety behavior in organizations.

Hypothesis $H_4$ of the study was stating that safety attitude in projects mediate the relation among safety climate in projects and safety behavior in projects; the results of the present study and past literature have also supported this hypothesis. Hence, with the acceptance of the fourth hypothesis, it can be concluded that safety attitude in projects creates positive safety climate perceptions between project participants which then lead to positive safety behavior in projects.

### 5.1.5 Hypothesis $H_5$: Safety Specific Transformational Leadership Acts as a Moderator in the Relationship of Safety Climate in Projects and Safety Attitude in Projects, Such that it Strengthens the Association.

The fifth hypothesis in our research acts as a moderator in the relationship of safety climate and safety attitude in projects; means that if safety specific transformational leadership in projects is strong, the associate relation between safety climate in projects and safety attitude in projects strengthens. However, the hypothesis 5 of the study is not supported through results interpreting safety-specific transformational leadership doesn't moderate between the variables; safety climate in projects and safety attitude in projects based on the un-standardized regression analysis ($\beta$=-0.013, t= 0.26, $p$= .79). The value of t =-0.26 is less than 2 (t < 2) representing the insignificant association and the upper limit value of -0.11 and the lower limit value of 0.79 indicating presence of zero in bootstrapped 95% of the confidence interval upper and lower limits (-0.11, 0.79) showing no moderation. Therefore, Safety specific transformational leadership acts as a moderator in the relationship of safety climate in projects and safety attitude in projects, Such that it strengthens the association, is rejected.

Literature suggests that Safety-specific transformational leadership is negatively impacting the occupational injuries by positively affecting safety climate perceptions; due to the reason that transformational leaders create positive safety climate with their repeated safety actions (Barling et al., 1996; Clarke, 2013; Mullen & Kelloway, 2009; Smith et al., 2016). On the basis of these evidences it was hypothesized that safety-specific transformational leadership acts as a moderator for the relationship between safety climate in projects and safety attitude in projects such that in the presence of high specific transformational leadership the relation between safety climate in projects and safety attitude in projects strengthens. Although, considering the statistically insignificant results, this hypothesis was rejected.

There might be several reasons for the previous rejection. Many studies on general transformational leadership have shown that transformational leadership has been related to employee active involvement in safety behaviors (Zohar, 2008). So, it was anticipated that safety-specific transformational leadership will execute in the same manner. However, these two leadership forms are not synonymous. One of the reasons for this insignificant relation can be a study has indicated that the relationship between specific transformational leadership in projects and safety attitude in projects exists but in the presence of other mediating variables like trust. According to Conchie, Taylor, and Donald (2012) behaviors and actions of transformational leaders have an impact on employee safety attitude in projects because transformational leaders build trust in employees to go beyond their duties and obligations. Another study has stated that safety-specific transformational leadership in projects influence safety attitude of employees, safety outcomes and safety participation through training (Toderi, Balducci, & Gaggia, 2016).

In their study Shen, Ju, Koh, Rowlinson, and Bridge (2017) have cleared safety-specific transformational leaders produce a considerable safety climate in existence of a mediator which is safety-specific leader-member exchange. Which are the interactions of leaders and employees related to safety issues. Because in projects activities are performed with the collective interactions of project participants which involve project leaders and project employees. Studies have also stated that

safety attitudes are affected by employee cultural backgrounds. Projects often involve employees from different backgrounds having different cultures (Mullen & Kelloway, 2009). Which make it difficult for leaders possessing specific transformational leadership type to create a considerable safety climate in projects.

## 5.2 Research Implications and Suggestions

So far, no previous study has examined the effect of safety climate in projects on safety behavior in projects especially for the Pakistani context. Hence, this study has both theoretical and practical implications tend to be fruitful for project based organizations in Pakistan in multiple ways. Theoretically, our study is capable to contribute to the available safety climate literature, leadership research and most primarily the current field of project management, therefore opening new courses and different dimensions adding to existing finite knowledge. The findings of the study are practically considerable and understandable since a positive and effective correlation between the variables; safety climate and safety behavior has been prove, along with the mediating function of safety attitude which is getting great attention at the recent time because of its adequate evidence through previous studies and effective impacts on the stability of projects and associated employees in the context of Pakistan.

Researchers have been conducted on safety climate since long but due to complicated nature of development either it has positive or negative impact on safety behavior in projects is never clearly answered presenting need to explore it further. Yet, up to our knowledge, no intervening mechanisms under various settings are tested to date as performed in our model; introducing safety attitude in projects as a mediator that is revealed as a possible outcome of safety climate in projects which in terms effects safety behavior in projects. The recommendations of this study validated safety climate in projects as a direct influence for safety attitude in projects. That consequently positively predicts safety behavior in projects.

Practically given the associated effect of safety climate in projects on safety behavior in projects, project-based organization can apply strategies that motivate

leaders to use all safety climate measures which in turns enhance the safety behaviors of employees in project to achieve the success deliverables of the project. These strategies might motivate the leaders of an endeavor to proactively identify, analyze and determine suitable controls for safety climate measures and risks as well as to effectively communicate and negotiate with stakeholders regarding safety climate measures and risks. Moreover mangers of the projects are advised to clearly identify and implement related components of safety climate and employees behavioral management system. Hence, our study has also focused on studying the considerable impact of safety attitude in projects on safety behavior in projects. Our attitudes impact our behavior and therefore the identification of attitudes considered as a potential hurdle to working safely in projects is necessary. However it is easier to change attitudes than it is to change a person's beliefs.

Besides, the moderation functions of specific transformational leadership in projects for the variables: safety climate in projects and safety attitude in projects has been analyzed in our study. Results showed that this moderation effect is rejected. However, specific transformational leadership type is to be assumed as an effective function in motivating the project's employees to achieve the project success; as well as we can't ignore that leadership has the strongest impact on the employees behaviors and attitude to motivate them to work safely inside the projects. Finally, a modern, structured and developed safety plan which identifies all the information, knowledge, procedures, risks, guidelines, techniques and measurements for delivering an adequate safety system in the project-based organizations in Pakistani context.

## 5.3 Limitations of Research

Despite of extensive literature on safety climate in projects and increased research trends on safety attitude in projects as a variable to study safety climate measures, this domain of research is still open to be explored more. Our study is same like every previous study has some limitations due to multiple constrains and risks we have faced during research work, such as time and resources. Firstly, this research

was conducted among the project based organizations which may be affecting the results if studied for other types of organizations. Moreover, this study has been conducted within bound resources and fixed time that's why convenience sampling technique was selected for the size of sample; this technique somehow limits the generalization of results.

Also, this study was conducted within Pakistani context, where there is a huge difference in culture; however, if this model will be tested in another context, results will not match the expected findings and it will be different due to the cultural context of Pakistan.

Collection of dyadic data is another limitation which we have found in our study; as it was challenging to collect data from leader separately from the employee, since it was difficult to reach the same employee to fill the second part of the questionnaire; and most of them were not interesting to fill the questionnaire honestly. However following this style of data collection was highly required for our research results.

## 5.4   Future Research Directions

In this research the hypothesized paradigm is being tested for checking the impact of safety climate in projects on safety behavior in projects with mediator as safety attitude in projects and mediator as specific transformational leadership in projects, but for future research orientations the illustrated variables can be explored with different proportion; especially after highlighting the limitations of this study. Many studies suggest that some new orientations for safety climate in projects research can be further discovered (Bryman, 2016). That tends to be acknowledged in project management sector (Choudhry, Fang, & Mohamed, 2007). For example, how supportive motivational procedure such as psychological possession and self-efficacy can cooperate with safety climate to influence safety behaviors in projects more widely (Griffin & Curcuruto, 2016). Therefore, establishment in the study of motivation in organizations suggests some new future orientations for researching safety climate. However, self determination study and

models of psychological empowerment advice a better effective function of personal motivation (Zohar, 2008).

Further, it is suggested to move further to the next stage of scientific inquiry to create strong bonds relationships with new moderators and mediators (Zohar, 2010). Hence, it is advice to study the model with a different moderating variable like "transactional leadership style" hence can produce different results (Hon & Chan, 2009). As our moderating variable "safety specific transformational leadership" was rejected in this study.

## 5.5 Conclusion

This study is attempted to develop a framework for safety climate in projects impact on safety behavior in projects of Pakistani organizations. That is highlighted as an important topic in project management researches; as it provides the complete guide for the team members to accomplish their goals safely. A questionnaire survey was carried out for collecting data from the Pakistani project-based organizations, intended to discover the impact of safety climate in projects on safety behavior in projects with mediator role as safety attitude in projects and moderating role as specific transformational leadership in projects. About 350 questionnaires were distributed for the purpose of investigating the relations between the proposed variables of this study but only 294 questionnaires were selected and finalized to be used for performing the analysis. Using statistical testing it was proved that the reliability of the proposed model was appropriate. Also, this current study was supported by concept of social exchange theory that demonstrates a direct relation among the variables; safety climate in projects and safety behavior in projects. However, it was found that the moderation function of specific transformational leadership in projects within safety climate in projects and safety attitude in projects was rejected which might be due to the perceptions of some researchers that there is a need to have a mediator connecting the correlation between these variables; safety specific transformational leadership and safety attitude in projects; for example: trust and training; also due to the

huge cultural difference of Pakistan. Overall, this study provided a comprehensive and evident-based view of safety climate in projects impact on safety behavior in projects through with the mediating role of safety attitude in projects.

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# Appendix

## Survey Questionnaire

**Dear respondent,**

I am a student of MS Project Management Capital University of Sciences & Technology, Islamabad. I am conducting a research on the topic: **"Impact of Safety Climate on Project's Safety Behavior, Mediating Role of Project's Safety Attitude and Moderating Role of Project Specific Transformational Leadership**. You can help me by completing the attached questionnaire. I appreciate your participation in my study and I assure that **your responses will be held confidential** and will only be used for education purposes.

Maha Ismail,

MS Scholar,

Capital University of Sciences and Technology, Islamabad.

## Demographics

| | 1 | 2 | | |
|---|---|---|---|---|
| **Gender** | Male | Female | | |
| | 1 | 2 | 3 | 4 |
| **Age** | 18-25 | 26-33 | 34-41 | 42 and above |
| | 1 | 2 | 3 | |
| **Qualification** | Bachelors | Masters | MPhil and Above | |
| | 1 | 2 | 3 | 4 |
| **Experience** | 0-5 | 6-10 | 11-15 | 16 and Above |

**Please tick the relevant choices as specified**

where (1= Strongly Disagree,2= Disagree,3=Neutral,4=Agree,5=Strongly Agree)

## Safety Climate

| 1 | In my organization safety is as important as quality of the work and getting the work done on time. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 2 | Those in charge of safety have the authority to make the changes they think are necessary. | 1 | 2 | 3 | 4 | 5 |
| 3 | Workers and management work together to ensure the safest possible conditions. | 1 | 2 | 3 | 4 | 5 |
| 4 | No major shortcuts are taken when worker safety is involved. | 1 | 2 | 3 | 4 | 5 |
| 5 | The safety of workers is a high priority for my organization. | 1 | 2 | 3 | 4 | 5 |
| 6 | My organization acts quickly when a safety concern or problem is raised. | 1 | 2 | 3 | 4 | 5 |

| 7 | My organization listens carefully to workers' ideas about improving safety. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 8 | Formal safety inspections are regularly conducted in my workplace. | 1 | 2 | 3 | 4 | 5 |
| 9 | My group manager has the best interests of group members in mind. | 1 | 2 | 3 | 4 | 5 |
| 10 | Employees are told when they do not follow good safety practices. | 1 | 2 | 3 | 4 | 5 |
| 11 | There are frequent communications about safety in my workplace. | 1 | 2 | 3 | 4 | 5 |
| 12 | Speaking up and encouraging others in this group to get involved in ethical issues that affect the group is part of my job. | 1 | 2 | 3 | 4 | 5 |
| 13 | Workers are regularly asked about their safety concerns. | 1 | 2 | 3 | 4 | 5 |
| 14 | Where I work, I feel free to report safety concerns. | 1 | 2 | 3 | 4 | 5 |
| 15 | I understand what my rights and responsibilities are for safety. | 1 | 2 | 3 | 4 | 5 |
| 16 | At my workplace, everyone has the information they need to work safely. | 1 | 2 | 3 | 4 | 5 |
| 17 | Workers are involved in decisions affecting their safety. | 1 | 2 | 3 | 4 | 5 |
| 18 | New employees at my organization learn quickly that they are expected to follow safety practices. | 1 | 2 | 3 | 4 | 5 |
| 19 | Co-workers often help and remind each other to work. | 1 | 2 | 3 | 4 | 5 |
| 20 | My workplace values safety. | 1 | 2 | 3 | 4 | 5 |
| 21 | My workplace regularly has safety awareness events. | 1 | 2 | 3 | 4 | 5 |
| 22 | My workplace has a safety committee that is effective at improving safety. | 1 | 2 | 3 | 4 | 5 |
| 23 | Safety is given a high priority in training programs. | 1 | 2 | 3 | 4 | 5 |
| 24 | My organization invests a lot of time in safety training | 1 | 2 | 3 | 4 | 5 |

| | for workers. | | | | | |
|---|---|---|---|---|---|---|
| 25 | My workplace ensures I understand what my responsibilities are for safety. | 1 | 2 | 3 | 4 | 5 |
| 26 | At my workplace, there are rules and procedures about how to work safely. | 1 | 2 | 3 | 4 | 5 |
| 27 | Im clear on how the safety rules affect me. | 1 | 2 | 3 | 4 | 5 |
| 28 | In my workplace everyone has the tools and equipment they need to do their job safely. | 1 | 2 | 3 | 4 | 5 |

## Safety Behavior in Projects

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Helping teach safety procedures to new crew members. | 1 | 2 | 3 | 4 | 5 |
| 2 | Assisting others to make sure they perform their work safely. | 1 | 2 | 3 | 4 | 5 |
| 3 | Getting involved in safety activities to help my crew work more safely. | 1 | 2 | 3 | 4 | 5 |
| 4 | Helping other crew members learn about safe work practices. | 1 | 2 | 3 | 4 | 5 |
| 5 | Helping others with safety related responsibilities. | 1 | 2 | 3 | 4 | 5 |
| 6 | Making safety-related recommendations about work activities. | 1 | 2 | 3 | 4 | 5 |
| 7 | Speaking up and encouraging others to get involved in safety issues. | 1 | 2 | 3 | 4 | 5 |
| 8 | Expressing opinions on safety matters even if others disagree. | 1 | 2 | 3 | 4 | 5 |
| 9 | Raising safety concerns during planning sessions. | 1 | 2 | 3 | 4 | 5 |
| 10 | Protecting fellow crew members from safety hazards. | 1 | 2 | 3 | 4 | 5 |
| 11 | Going out of my way to look out for the safety of other crew members. | 1 | 2 | 3 | 4 | 5 |
| 12 | Taking action to protect other crew members from risky situations. | 1 | 2 | 3 | 4 | 5 |

| 13 | Trying to prevent other crew members from being injured on the job. | 1 | 2 | 3 | 4 | 5 |
|----|---|---|---|---|---|---|
| 14 | Taking action to stop safety violations in order to protect the well-being of other crew members. | 1 | 2 | 3 | 4 | 5 |
| 15 | Explaining to other crew members that I will report safety violations. | 1 | 2 | 3 | 4 | 5 |
| 16 | Telling other crew members to follow safe working procedures. | 1 | 2 | 3 | 4 | 5 |
| 17 | Monitoring new crew members to ensure they are performing safely. | 1 | 2 | 3 | 4 | 5 |
| 18 | Reporting crew members who violate safety procedures. | 1 | 2 | 3 | 4 | 5 |
| 19 | Telling new crew members those violations of safety procedures will not be tolerated. | 1 | 2 | 3 | 4 | 5 |
| 20 | Attending safety meetings. | 1 | 2 | 3 | 4 | 5 |
| 21 | Attending no mandatory safety-oriented meetings. | 1 | 2 | 3 | 4 | 5 |
| 22 | Keeping informed of changes in safety policies and procedures. | 1 | 2 | 3 | 4 | 5 |
| 23 | Trying to improve safety procedures. | 1 | 2 | 3 | 4 | 5 |
| 24 | Trying to change the way the job is done to make it safer. | 1 | 2 | 3 | 4 | 5 |

## Safety Specific Transformational Leadership

| 1 | Express satisfaction when I perform my job safely. | 1 | 2 | 3 | 4 | 5 |
|----|---|---|---|---|---|---|
| 2 | Makes sure that we receive appropriate rewards for achieving safety targets on the job. | 1 | 2 | 3 | 4 | 5 |
| 3 | Provides continuous encouragement to do our jobs more safely. | 1 | 2 | 3 | 4 | 5 |
| 4 | Shows determination to maintain a safe work environment. | 1 | 2 | 3 | 4 | 5 |
| 5 | Suggests new ways of doing our jobs more safely. | 1 | 2 | 3 | 4 | 5 |

| 6 | Encourages me to express my ideas and opinion about safety at work. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 7 | Talks about his/her values and beliefs of the importance of safety. | 1 | 2 | 3 | 4 | 5 |
| 8 | Behaves in a way that displays a commitment to a safe workplace. | 1 | 2 | 3 | 4 | 5 |
| 9 | Spends time showing me the safest way to do things at work. | 1 | 2 | 3 | 4 | 5 |
| 10 | Would listen to my concerns about safety on the job. | 1 | 2 | 3 | 4 | 5 |

## Safety Attitude in Projects

| 1 | Accident prevention is predominantly the responsibility of the individual. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 2 | Most accidents are preventable. | 1 | 2 | 3 | 4 | 5 |
| 3 | Other individuals have greater responsibility for accident prevention than individuals themselves. | 1 | 2 | 3 | 4 | 5 |
| 4 | Our project probably increases current spending on accident prevention. | 1 | 2 | 3 | 4 | 5 |
| 5 | Accidents prevention strategies can save money by reducing the number of accidents that need treatment. | 1 | 2 | 3 | 4 | 5 |
| 6 | Our project should fund safety equipment for those on low income. | 1 | 2 | 3 | 4 | 5 |

## Thank you for your time and cooperation