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Applying attribution theory to Crane Operators and Crane Supervisors' perceptions of incident causation.

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"A research project submitted in partial fulfilment of the requirements for the degree of MA by coursework and Research Report in the field of Industrial Psychology in the Faculty of Humanities, University of the Witwatersrand, Johannesburg, March 2019."

Plagiarism Declaration

I, Jessie Tebogo Mashapa, declare that this research project is my own, unaided work. It has not been submitted before for any other degree or for examination at this or any other university.

Signed: _____

Date: _____

Acknowledgements

It is with great excitement and disbelief that I get to write the acknowledgements section of my research paper. It means that I have finally completed my Masters Research Report. Although there were times I wasn't sure when this day would come, I always knew that it would, and finally, I am here.

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Abstract

Crane incidents occur in the ports of South Africa and around the world in the maritime industry. Crane Operators' and Crane Supervisors' accounts of such events are used in investigations and therefore the accuracy of the findings from the incident investigation is important because these findings inform the remedial actions that must be taken to address the cause (s) of the incident. The aim of this research paper is to understand and compare Crane Operators' and Supervisors' perceptions of why incidents happen using attribution theory (Heider, 1958). In this qualitative study, 16 participants from a port in South Africa were used. Specifically, 8 crane operators and 8 crane supervisors. The two groups were interviewed using semi-structured interviews. Thematic content analysis was conducted on the interview data to identify the emerging themes between the two groups utilizing a systems thinking approach (Wilson, 2014). The results support Gyekye (2010), demonstrating that supervisors are more inclined to attribute crane incidents to internal factors of the crane operators while the crane operators are more inclined to attribute crane incidents to external, systemic factors. Both groups identified external factors such as mechanical and maintenance issues, weather conditions, communication, training and skills, and safety culture as factors contributing towards crane incidents. The supervisors were more prone to identifying personal factors attributed to crane operators such as a lack of concentration, fatigue, skills and eye sight as causal factors. Conversely, Crane Operators mostly felt that these factors were insignificant in causing any incidents. The results of the study are also in contradiction to Gykye (2010) in that Crane Supervisors were also shown to take a protective stance by making external attributions to crane incidents. The cultural backgrounds of the two groups were found to have an influence on the way they perceive incidents. This was mostly observed in the Cane Supervisor group where the cultural background of the Crane Supervisors influenced them to blame external situations for the causes of crane incidents instead of placing the blame on Crane Operators as predicted. Safety culture and blame culture were also found to influence the way in which both groups perceive incidents. Both groups were found to be motivated to make external attributions that place the blame on situational factors as a way of diverting blame and punishment away from Crane Operators. This paper was able to show the inaccuracies which exist in the current method of data collection during incident investigations and also provide a foundation for future research on the topic. It supports the notion that incident investigations should move away from human error analysis and focus more on the entire socio-technical system in order to identify the true causes of incidents. By analysing

the relevant factors which contribute towards crane incidents within the organisation, crane incidents can be prevented and reduced.

Keywords: Attribution theory, crane incidents, incident investigations, systems thinking, blame culture and safety culture.

CHAPTER 1: INTRODUCTION

1.1 Background

The transport system plays a pivotal role in the daily economic activities of South Africa. These activities include the transportation of people, goods and services and therefore without a reliable transport system, the economic growth of the country will be compromised (Department of Transport, 2017; Transnet Port Terminals, 2017). To emphasise the importance of the transport system, the Department of Transport highlights that transport in South Africa is the "heartbeat of economic growth and social development" (Department of Transport, 2017. p.1). This importance was further emphasised in the National Development Plan (NDP) of South Africa which states that the development and maintenance of an efficient and competitive transport system is a key objective (National Development Plan 2030, 2012). Therefore, it is important for researchers to find ways of increasing the efficiency, and safety of transport systems by addressing issues that cause delays, inefficiencies, accidents and slow-turnaround times across different disciplines such as psychology, engineering and systems thinking (Goode, Salmon & Lenne, 2013; Leveson, 2010; Rasmussen, 1997).

The current research study aims to address the above-mentioned challenges, specifically in the maritime industry by using attribution theory to understand and compare Crane Operators' and Crane Supervisors' perceptions of why incidents happen. Further, the application of attribution theory to crane incident analysis can explain how Crane Operators and Crane Supervisors arrive at their causal attributions in the event of an incident. In the event of a crane incident, Crane Operators and Crane Supervisors' accounts of crane incidents are used during incident investigations and the accuracy of the findings from these investigations is important as it informs the remedial actions that must be taken. Accurate remedial actions would decrease delays caused by machine failures and time lost during incident investigations leading to increased productivity and a greater contribution to the economic growth of the country.

The South African transport system comprises of 4 modes of transport: aviation, road, rail and maritime (Department of Transport, 2017). As mentioned above, this research study will be focused on maritime transport with particular reference to port operations and namely ship-to-shore crane operations. Ship-to-shore crane operations include the loading of containers onto vessels and offloading of containers from vessels (Maritime Injury Centre, 2017). The Maritime Injury Centre described port terminals as one of the most dangerous places to work because of the crane operations that take place with the loading and offloading of cargo from vessels

(Maritime Injury Centre, 2017). Employees working in the maritime industry are exposed to a number of risks, but those working with equipment such as cranes either on vessels or on the dock are found to be exponentially exposed to more risks due to the nature of the equipment that is used (Maritime Injury Centre, 2017). Some of the risks associated with the operating of cranes include lack of available safety equipment, mechanical failures, operator errors and insufficient training (Maritime Injury Centre, 2017). Holstering containers with the use of cranes is risky in that loads can be dropped, or containers can be bumped. The dropping and bumping of containers can result in damaged cargo and even damage to the crane itself (Maritime Injury Centre, 2017). Workplace safety is a critical issue in the maritime industry where an increase in the number of crane incidents could compromise this.

1.2 Crane Incidents in the Maritime Industry

As mentioned above, the increase in the amount of crane incidents in ports can compromise workplace safety as well as affect the productivity of the maritime industry and therefore the economic growth of the country. In recent years, crane incidents have increased resulting in delays in operations, time lost during investigations and disciplinary hearings and a loss of income for ports (Lam, Tok & Darley, 2007). This challenge has been addressed through incident investigations that take into account Crane Operators', Crane Supervisors' and the technical team's account of the event. Despite incident investigations being carried out after every reported incident, incidents are still very prevalent causing one to ask, "Is the current approach to incidents efficient?"

The increase in the number of incidents in ship-to-shore crane operations around the world has created the need to further explore the causes of crane incidents (Lam, Tok & Darley, 2007). The increase in crane incidents could be due to the increase in the number of cranes on site, the increase in the pace of moving containers and the difficulty in keeping maintenance and safety procedures up to date with the changes taking place with crane operations (Lam et al., 2007). Crane incidents form part of workplace incidents, a topic that has been extensively researched in the field of occupational health and safety. Despite the extensive research on incidents in the field of occupational health and safety, limited research has been conducted to analyse the perceptions of the different parties that are involved in the investigation of the incidents (Cajee, 2005). Therefore, this research study aims to analyse and compare the different parties' perceptions of the incident using attribution theory. Understanding the different perspectives and similarities can aid researchers and investigators to come up with approaches that can give more

accurate accounts for the causes of workplace incidents which will be discussed in the following section.

1.3 Workplace Incidents

Workplace incidents are often described as unplanned and un-intentional events that usually result in injury or damage and involve a human element (Lam et al., 2007). For example, when a crane incident involving the lifting of a container takes place, the crane will be under human control and thus there is normally a human element involved in the crane incident causation. Therefore, a lot of focus is placed on the human element when it comes to incident investigations (Grech, Horberry, Koester, 2008). The focus on the human element often fails to reveal the true cause of the incident because it fails to take the whole system into consideration, leaving the investigators and the organisation with a limited perspective.

An additional shortcoming of focusing on the human element is that it can often result in a punitive culture in the organisation that arises from finding a person to blame especially when the incident is deemed to be serious. A punitive culture results in low incident reporting due to fear of being disciplined by the supervisor or the organisation and thereby hampering the organisation's ability to learn from the events (Dekker, 2003). The dynamics of incidents in the workplace trigger a process of constructing causal inferences on the events that have taken place; a process that involves information processing to make sense of the situation (Dejoy, 1994). This process is important since the involved parties such as the operators and supervisors are expected to give their account of the events as part of the compilation of an incident report. The information gathered from the parties' accounts of the events are used to create an incident report which informs the remedial actions that are to be taken by the organisation (Dejoy, 1994). This demonstrates that attributions are at the core of incident reporting and therefore at the core of safety management in the workplace (Dejoy. 1994). By understanding and comparing Crane Operators' and Supervisors' perceptions of why incidents happen, accurate and effective incident reporting systems can be established, and organisations will be enabled to learn from incidents and take appropriate measures to prevent such incidents from worsening or taking place in the future (Sullivan, 2001 & Reason, 1997).

Further, the application of attribution theory to incident analysis can create an understanding of how incident attributions are developed and affected by individual and organisational factors as well as bias (Gyekye, 2010; Dejoy, 1994). Therefore, this research aims to highlight attribution

theory and to identify whether Crane Operators and their supervisors have similar or different attributions to why crane incidents occur.

1.4 Research Aims

There has been limited research on crane incident causation in the maritime industry in South Africa and even more so the application of attribution theory to workplace incidents in the South African context (Cajee, 2005). The researcher was unable to find any research which applied attribution theory to workplace incidents in South Africa with the exception of Cajee (2005). Therefore, this research study aims to analyse and compare Crane Operators and Supervisors' perceptions on incident causation by the application of attribution theory. Attribution theory is effective in comparing perceptions of individuals and groups, for example, prior research has shown that hierarchical level in the organisation has an effect on individuals' attributions concerning workplace incidents (Gyekye, 2010). Further, a systems thinking approach will be utilised to uncover the complexity and interactions of the causal factors of crane incidents (Wilson, 2012). The exploration of perceptions on incident causation from both parties mentioned above will aid the organisation in developing more effective incident investigation procedures that the organisation can learn from; and demonstrate the importance and effects of organisational culture on workplace safety, specifically with regards to safety and discipline. Secondly, the research study is part of a larger study conducted at the University. The larger study is focused on determining whether the recruitment, selection and training of Crane Operators are possible contributors to increased incidents in a large logistics company in South Africa. This study will contribute towards the larger study by exploring the different perceptions of Crane Operators and supervisors in what contributes to and causes crane incidents.

To address the research topic, "applying attribution theory to Crane Operators and Supervisors' perceptions of incident causation", the research report will be outlined as follows: A literature review on attribution theory, incident causation, systems thinking as well as a learning and just culture in organisations will be provided to the reader. The research report will then provide information on the methods used and the results obtained on the research questions developed for the study. Following the results chapter, there will be a discussion on the research findings, the limitations of the current research study, future recommendations and finally the conclusion.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The aim of this chapter is to provide the reader with a summary of previous literature and research that has formed the foundation and/or influenced contemporary research in the topic area of the current research study, "applying attribution theory to Crane Operators and Crane Supervisors' perceptions of incident causation". This chapter will include information on attribution theory, incident causation, the application of systems thinking to incident analysis and a learning and just culture in organisations. It should be noted that most of the attribution literature is dated and most researchers applying attribution still reference the classic theorists of attribution such as Heider (1958), Jones and Davis (1965), Kelley (1967) and Weiner (1979,1976,1972).

2.2 Attribution Theory

Psychology researchers have been exploring the effect of attribution processes on people for decades (Forsterling, 2001; Heider, 1958; Weiner, 1979). Their interest in the topic stems from the fact that attribution processes affect the manner in which past, present and future events are interpreted; the manner in which individuals find meaning and make sense of the environment; and individuals' levels of motivation (Wilcox, 2015; Weiner, 1976; Heider, 1958). Attribution processes also play a pivotal role in establishing and maintaining consistency between the beliefs and thoughts of people and in preventing the adverse impact that may originate from a lack of consistency. The internal consistencies that are developed through attribution processes allow people to understand, predict and control their daily situations (Forsterling, 2001). The vital premise of attribution theory is for people to "understand and predict future events" (Wilcox, 2015, p.1).

Heider (1958), Jones and Davis (1965), Kelley (1967) and Weiner's (1979, 1976, 1972) attribution theories have been utilised as theoretical frameworks to enable researchers to understand how the lay person makes sense of and interprets events and what the psychological consequences of those interpretations are (Forsterling, 2001). Researchers have applied attribution theory to topics such as depression and achievement behaviour; and interpersonal relationships and social affiliations to develop strategies for conflict resolution and to enhance satisfaction and longevity in relationships (Rempel, Ross, & Holmes, 2001). The theories also

provide a framework on how individuals evaluate the relationship between cause and effect factors to form explanations. The attributional approach argues that people seek to decipher the day-to-day behavioural and environmental events that take place in their lives by interpreting the causes and consequences of those events (Harvey et al., 1976). Each individual is exposed to a variety of events or experiences based on their upbringing, their social relationships and environment and these events influence the way they see the world and make decisions (Cajee, 2005). In other words, how they perceive events.

2.3 Current Research Study

The current research study is focussed on Crane Operators and supervisors from a port terminal in South Africa which consists of employees from different cultures, ethnic groups, backgrounds, religions and genders. According to attribution theory, individual employees will have different factors affecting the way they perceive events and how they arrive at causal attributions, therefore this can result in discrepancies between the views of employees in organisations. In the case of this research, the employees included the Crane Operators and their supervisors and the objective of this research is to determine if there are differing perceptions between the two groups regarding the causes of incidents. The differences in work related experiences between Crane Operators and supervisors can also result in discrepancies in their perceptions of a specific incident. The concept of 'the interpretation of causes, is fundamental in attribution theory. Gronhaug and Falkenberg (1994) refer to attribution theory as the study of perceived causation.

To gain a better understanding of attribution theory, the works of various attribution theorists whose research contributed to the common core ideas of the theory will be briefly reviewed. As described by Martinko (1995), attribution theory is made up of a variety of perspectives that evaluate how people perceive their own behaviours and the behaviours of others. There is no one specific theory that has been used as the core attribution theory (Martinko, 1995). Hewstone (1983) cited four authors whose research has formed an essential part of attribution literature, namely Heider (1958), Jones and Davis (1965) and Kelley (1967). All the above-mentioned theorists have a number of themes in common. They use common-sense explanations for behaviours and events and they have included the themes of the perspective of the layperson, constructive and active causal interpretation and the mediational relationship between stimulus and response in their research studies (Cajee, 2005; Gundlach, Martinko & Douglas, 2003; Graham & Folkes, 2014).

The lack of one dominant attribution theory has therefore resulted in attribution theory becoming a difficult theory to describe. To help the reader understand this theory and approach, the next section will look at the three main dominating attribution theories by Heider (1958), Jones and Davis (1965) and Kelley (1967) as well as Weiner's (1976) contributions to the theory.

2.4 Heider's Analysis of Naïve Psychology

Heider (1958) proposed that human beings were like naïve psychologists trying to make sense of the world and the people in it. This naïve psychology can be described as a 'common sense psychology' that guides the behaviour of humans with the use of prior behavioural perceptions. Humans develop perceptions of the people and situations around them as part of their day-to-day interactions with their environment. Furthermore, humans use past behaviours of people as a reference of their stable characters. Heider (1958) also proposed that causal attributions on certain behaviours become so entrenched that when individuals are certain of the cause of a behaviour they have identified, they cease to explore other possible causes (Heider, 1958; Wilcox, 2015). Heider's (1958) research uncovered two motives for people's behaviour: (1) the need to understand the environment they find themselves in and (2) the necessity to be in control of that environment.

To define attribution, Heider gave a clear explanation in Harvey, Ickes & Kidd (1976). He described attribution as playing a role in the way in which we understand our environment, meaning that whenever we perceive our environment, attribution takes place (Harvey, Ickes & Kidd, 1976). During this process of trying to understand our environment, attribution takes place immediately and spontaneously (Dunker, 1947). The reason attribution occurs is so that people can find a way of making sense of the things around them and so that they can feel like they have a sense of control over their surroundings (Harvey & Weary, 1984; Heider, 1958).

Heider (1946) hypothesised that causal unit formations and attitudes towards individuals have an influence on each other. Causal units are formed when the cause and effect, and actor and act are observed as being different components of a 'causal unit'. To explain this concept, an example is that of a crane incident where a Crane Operator's attitude towards the incident can affect the attitude they will have towards the individual who caused the incident. If the Crane Operator observing the crane incident felt that the incident was as a result of negligence by an operator who they view as negligent, the incident will be easily ascribed to that operator. However, if the same incident was caused by an operator who was viewed as responsible, the Crane Operator would struggle to obtain a balanced alignment within his causal unit (Heider,

1946). A balanced alignment is achieved when there is consistency between the attitude towards the individual and the incident (Heider, 1946).

Heider (1946) also observed proximity and similarities as factors that played a role in shaping attributions. For example, bad situations are often associated with individuals that have a bad reputation (Fauconnet, 1928 & Heider, 1946). The result of linking the actor and the act is that humans are more likely to make attributions to people than to situations because people are identified as models of other people and people are more likely to attribute their failures to other people as a way of protecting their egos (Gronhaug & Falkenberg, 1994).

Heider (1958) proposed that naïve psychologists attribute behaviours into two categories, behaviours caused by the individual (internal causes) and behaviours caused by factors outside of the individual (external causes). When individuals analyse people's behaviour, they attribute those behaviours to either internal or external causes. Therefore, according to Heider (1958), there are two different types of explanations for an incident. The two types are internal which focuses on personal explanations and external which focuses on situational or contextual explanations for events. When an individual attributes an incident to internal factors, they perceive themselves as being primarily responsible for causing the incident and when they attribute the incident to external factors, they believe that the cause of the incident was due to situational circumstances and outside of their control (Gyekye, 2010). People commonly ascribe good performance to causal factors that are internal to them and poor performance or negative outcomes to causal factors external to them (Schaffer, 2002; Gronhaug & Falkenberg, 1994). This demonstrates that attributions can be 'motivational' or 'self-serving' (Schaffer, 2002; Bettman and Weitz, 1983).

Heider's (1958) theory laid the foundation for attribution researchers such as Jones and Davis (1965) and Kelley (1967) who expanded on the concepts of inferring causal attribution and the situational and dispositional causes of observed behaviours.

2.5 Jones and Davis: Correspondent Inference Theory

Jones and Davis (1965) expanded on Heider's (1958) theory by further exploring how people infer others' intentions and how the interpretation of those intentions translates to dispositions. In other words, the theorists were interested in understanding the intention behind the behaviour. By focusing on dispositions, the perceiver can obtain information that can enable them to make predictions on the actor's future behaviour and thereby ensure that the perceiver's environment is predictable and controllable (Jones & Davis, 1965; McLeod, 2010). According to

correspondent inference theory, the perceiver must determine whether the actor's actions were intentional based on two criteria: the actor's 1) ability and 2) knowledge. If the perceiver is certain that the actor has the ability and knowledge to carry out the observed behaviour it will be perceived as being intentional whereas if the actor was unaware of the consequences of his actions, these would be perceived as unintentional. The interpretation of these intentions or lack thereof informs the inferences that will be made on whether the actions of the actor can be attributed to personal explanations (internal) or situational explanations (external) (Gibson & Schroeder, 2003; Hewstone, 1983).

The main notion of this theory is that the observer perceives the actor's behaviour as a result of the actor's traits, meaning that there is a correspondence between the behaviour of the actor and a certain characteristic of that actor. For example friendly behaviour can be inferred to the characteristic "friendly".

Jones and Davis (1965) suggested that there are factors that influence correspondent inferences, for example choice, intentional behaviour, social desirability, hedonic relevance and personalism. Choice is when an actor behaves out of their own free will and the action will be perceived to be caused by a dispositional (internal) reason. Intentional behaviour is when the actor's behaviour is perceived to be deliberate, it is ascribed to the actor's personal disposition, whereas if the behaviour is accidental it is ascribed to situational reasons. Social desirability is when an actor behaves in a non-conforming manner and the actions are ascribed to dispositional (internal) reasons, whereas if the actor behaves in a socially desirable manner, their actions will be ascribed to situational (external) reasons. Hedonic relevance is when the actor's behaviour is perceived to be of relevance (whether positively or negatively) to the perceiver, the perceiver will find a more definite correspondence between the disposition, intention and act (Jones & DeCharms, 1957: Gronhaug & Falkenberg, 1994). Lastly, personalism is when the actor is perceived to act with the intention to directly affect the perceiver (whether positively or negatively), then the action will be perceived as 'personal' and this will result in a similar influence as hedonic relevance (Davis & Jones, 1965).

In conclusion, Jones and Davis' (1967) contribution to attribution theory provided additional information on how perceivers allocate internal attribution. Further, the theory supports Heider's (1958) theory that attributions may be distorted by the perceivers' values and motivations. The following section discusses Kelley's (1976) theory on covariation model and configuration

2.6 Kelley: Covariation Model and Configuration

Kelley (1967) proposed that people behave like scientists in order to uncover the causes of behaviours and events; and developed a rational model for evaluating whether specific events or actions should be attributed to internal or external causes. His theory is concerned with the information that is utilised to arrive at causal attributions and the manner in which that piece of information was utilised (Kelley, 1967; Hewstone, 1983). Covariation means that when two observed variables are related, a change in one of the factors should result in a change in the other variable as well. This change can either be negative or positive. To put it simply, McLeod (2010, p.1) argued that covariation takes place when "a person has information from multiple observations, at different times and situations, and can perceive the covariation of an observed effect and its causes". In the process of determining the causes for the people's behaviour, information is considered to identify three aspects of behaviour, namely: 1) consistency, 2) distinctiveness and 3) consensus.

Kelley (1971) introduced a variable that had not been previously included by Heider (1958) and Jones and Davis (1976). He introduced the variable of *time* by observing the occurrence of behaviours over a period of time to determine if there is *consistency* in the behaviour of the individual. If a current observed behaviour is similar to behaviours exhibited in the past, consistency exists. The second aspect, *distinctiveness* refers to the extent to which a person would repeat the same behaviour in a similar setting. If the behaviour that is observed in a current situation is not likely to occur in other similar situations, the behaviour is deemed to be distinctive (Ferris, Bhawuk, Fedor & Judge, 1995). The third and final aspect, *consensus* looks at whether the observed behaviour can be generalised to other individuals' behaviour in the same situation. A high level of consensus exists when the current observed behaviour is also observed in other individuals in the same setting. This aspect of behaviour is similar to the social desirability factor that Jones and Davis (1976) included in their theory of attribution in that it is concerned with the actions of various other individuals in the same situation. Kelley (1971) combined these aspects of behaviour, also known as 'informational cues' and formed a model demonstrating how the interactions of the 'informational cues' are used to conclude internal and external attributions.

Research by Schaffer (2002) amongst others, has shown that when a behaviour has low distinctiveness, low consensus and high consistency, individuals will attribute that behaviour to internal (dispositional) causes. Conversely, behaviour that has high distinctiveness, low consensus and high consistency will be attributed to external (situational) factors by individuals

(Schaffer, 2002; Martinko and Thompson, 1998; Ivancevich and Matteson, 1999). An example to illustrate the process for making attributions involves a teacher's reaction to a student's poor performance. The teacher has to decide whether the behaviour of the student is caused by internal (dispositional) or external (situational) factors. If the poor performing student has performed well in other classes and has received good results in previous exams (high distinctiveness); the student has never performed poorly before (low consistency) and the other students in the class also performed poorly in the specific class (high consensus), the teacher will attribute the student's behaviour to external factors (for example, ineffective teaching method). Conversely, if the student usually performs poorly in the current class and other classes (low distinctiveness); has performed poorly several times before (high consistency); and the other students are performing well (low consensus), the teacher will most likely attribute the poor performance to internal (personal disposition) factors. Therefore, the teacher's conclusion on whether the student is at fault for the poor performance is dependent on the level of distinctiveness, consensus and consistency. For a summary of the information patterns for the two attributions, refer to Table 1.

Table 1: Information Patterns for the Three Attributions

Adapted from Orvis, Cunningham, and Kelley's Information Patterns for the Three Attributions (1975, p. 607)

	Information Pattern		
Attribution	**Consensus**	**Distinctiveness**	**Consistency**
Person (Internal)	*Low*	*Low*	*High*
Situation (External)	*Low*	*High*	*Low*

Kelley (1972) addressed the limitation of the model by taking into consideration that the perceiver can often have limited data, lack of motivation and time to analyse the various observations. In this instance, attributions are made based on one observation utilising causal schemata. The schemata can be defined as formed mental models on how specific effects are produced through the interaction of different types of causes.

In addition, Kelley (1972) identified Multiple Sufficient Cause (MSC) schema as the easiest causal schemata to use when operating with limited data. This type of causal schema acknowledges that the same effect can be as a result of various causes. For example, a lack of preparation, and a negative environmental and psychological state can cause poor performance

at school. Researchers have also utilised this schema in studies illustrating the "discounting principle" (Thibaut and Riecken, 1995). The discounting principle can be defined as the innate tendency of humans to reduce the role played by one probable cause in a situation when other probable causes are present (Wilson, 2002). In the case of other probable causes being present, the part played by a specific cause in leading to the effect can be discounted. For example, lack of preparation can be discounted if there is a negative class environment (Gronhaug & Falkenberg, 1994).

The information on when and how schemata are utilised by individuals is not clear, however there is evidence that schemata may be used to make attributions in a fast and economical manner by lay persons (Gronhaug & Falkenberg, 1994).

All the above-mentioned theorists played a critical role in developing attribution theory as we know it today. Heider (1958) laid the foundation by presenting the distinction between internal and external attributions of behaviour. Jones and Davis (1967) then brought in the intentionality component that highlighted the intention of the observed individual in playing a role in the process of creating internal attributions. Kelley (1971) followed and built on Jones and Davis (1967) theory by including the component of time and the interaction of causal factors in leading to making internal or external attributions, therefore forming a model that includes the components of information, intentionality and situation. The concepts of attribution theory have been applied to organisational contexts in cases such as incidents and poor performance where managers develop causal attributions and make judgements on whether the incident or poor performance was caused directly by the employee (internal) or whether it was because of (external) factors (Martinko, 1995; Schaffer, 2002). The next section in the literature review will provide the reader with information on the factors that influence attributions under the heading of antecedents and consequences of attribution.

2.7 Antecedents and Consequences of Attribution

The purpose of this section is to gain a better understanding of the antecedents and consequences of attribution to enable the reader to easily identify the attributions that may emerge from the current research data. To facilitate the above-mentioned, the three theories of attribution will be integrated and discussed under shared headings and as previously mentioned, the three fundamental theories of attribution theory are Heider (1958), Jones and Davis (1967) and Kelley (1971).

2.7.1 Antecedents

The early research on attribution theory was concerned with the understanding of motives and intent and therefore antecedents of causal attributions was a dominant part of the earlier theories (Heider, 1958; Kelley, 1971). People were interested in understanding the reason behind certain behaviours and events and also understanding what motivates the individuals in the perceivers' social environment (Weiner, 1985). Heider (1958) and Kelley's (1967) theories explored the antecedents of causal attributions based on the assumption that individuals yearn to understand and master their environment. There are three antecedent factors that affect attribution, namely: 1) information, 2) beliefs and 3) motivation.

Information

As previously discussed under Jones and Davis' theory (1965), information on the effect of certain behaviours is utilised to interpret the intention behind certain behaviours (Gibson & Schroeder, 2003; Schaffer, 2002). Secondly, Newston (1974) provided empirical evidence on the principle of non-common effects which states that it is easier to identify the intention behind an act when there is a limited amount of effects linked to it, meaning that there are fewer non-common effects. This results in the perceiver developing more confident interpretations about the individual being perceived.

With regard to consensus information, McArthur (1972) discovered that the effect of consensus was weaker than that of distinctiveness and consistency. A second issue is that of the false consensus effect which was researched by Ross, Greene & House, 1977. The false consensus effect refers to the overemphasis on the internal causes of behaviour. Perceivers tend to believe that other individuals' reactions to certain stimuli are the same as theirs resulting in an inclination to have different outlooks to the internal attributes of the 'observed others'. The research in this topic area illustrates that the perceivers' personal reactions take priority over the consensus information external to the perceiver causing the perceiver to develop beliefs about consensus based on their own consensus information (Kelley and Michela, 1980; Cajee, 2005).

When it comes to consistency, an experiment by Himmelfarb (1972) demonstrated that when an individual is behaving inconsistently, their actions will be attributed to their circumstances (external) and not to their dispositions (internal). Another factor under information is that of the rule of similarity. The observed cause and effect should have similar characteristics to enable the perceiver to make interpretations on the cause based on the observed effect (McCauley and Jacques, 1979).

With regard to salience, researchers have shown that the most prominent cause that exists in the environment at the time of the observation will be attributed to the observed effect (Gibson and Schroeder, 2003; Gronhaug and Falkenberg, 1994).

The concept of primacy should also be considered when trying to understand how information affects the process of making causal attributions. Often, individuals ignore additional information that emerges once an attribution has been made or they adapt the information to align it with previous attribution (Jones et al., 1968).

Beliefs

The beliefs about previous consistencies affect the expectations that are placed on observed actors, for example the likelihood of causing an incident based on the number of times the actor has committed the incident previously (Schaffer, 2002; Kelley and Michela, 1980). This argument is aligned to Kelley's (1967) model which proposes that the actions which are consistent with expectations will be inferred to a stable personal disposition of the actor. Conversely, actions that are different to what is expected are inferred to circumstances or a situation (Deaux, 1976).

The behaviour of individuals in certain situations help us form expectations on what kind of behaviour is likely to occur should we encounter similar situations in the future. Kelley (1972) proposed that acts that are enforced by situational factors often discount individuals' motivation to carry out an act and therefore their actions will be attributed to external causes. For example, the actions of a person who drives 40 km/h on an urban road can be attributed to him/her being a cautious driver, however if there is a speed camera, observers may believe that the speed camera partially caused the behaviour (situational pressure). This concept is known as the discounting principle (Kelley, 1972). Jones (1979) further explored the concept and proposed that although external factors may be used to fully explain the observed actions, observers often fail to appropriately discount the observed unexpected actions, resulting in attribution error.

Observers believe that there should be a balance between the degrees of cause and effect. If there is an observed low or moderate effect, observers often believe that only a few caused factors are responsible and if there is an observed high effect, observers often believe that a mixture of causal factors was responsible (Alony, 2014; Cunningham and Kelley, 1975).

Beliefs don't just have an impact on the attributions that are formed for specific events, they affect the information we choose to use when processing 'causally relevant information' (Cajee,

2005). Further, people's beliefs don't only have an effect on the manner in which they process information, but there is a tendency to absorb information that is in agreement with their beliefs. Research has shown that prior beliefs about the causes of events and actions blind the observers from seeing true covariations in the information and misleads them to see covariations that do not truly exist (Golding & Rorer, 1972).

Motivations

A factor that may trigger the process of attribution is that of dependence on the observed individual by the perceiver (Lester, Turnley, Bloodgood & Bolino, 2002). Researchers have shown that when the perceiver is dependent on an individual it will affect the level of attention the perceiver observes, and analyses events and behaviours related to that individual (Berscheid, Graziano & Monson, 1976). People are motivated to put more effort into attribution processes such as data exploration and characteristic inferences when they are more dependent on the perceived subject. Factors such as the importance placed on the accuracy of the attribution have also been found to affect the complexity of explanations given on perceptions, with people giving more detailed accounts of events/observations after being made aware of the importance of the accuracy of their attributions (Kassin & Hochreich, 1977).

If an individual is responsible for positive behaviour which resulted in a successful outcome, the self-esteem of the individual can be enhanced, therefore individuals are motivated to enhance their self-esteem by making internal attributions for positive behaviours and outcomes and are motivated to protect their self-esteems therefore negative behaviours and outcomes are attributed to external factors (Gronhaug & Falkenberg, 1994). Further research on attributions for failures and success demonstrate that there is a tendency for people to attribute failure to external factors and success to internal factors whether they are perceiving themselves, people they know or strangers, showing that there is a universal acceptance that failures are externally caused, and successes are internally caused. This means that the motivation for enhancing self-esteem may not be the reason for people making internal attributions for positive behaviour (Kelley & Michela, 1980; Zuckerman, 1979).

People's attributions may also be impacted by their 'motivation to present themselves in a positive manner'. The well-established tendency to attribute success to internal factors may be affected by the motivation to present oneself in a favourable way, for example making an external attribution for a success in order to come across as a modest person (Feather & Simon, 1971).

Kelley (1972), observed that the predisposition towards making attributions to controllable factors gives people the motivation to continue pursuing their goals. This stems from the notion that if outcomes are due to factors within the individual's control, the individual has the ability to reach their goals through the application of effort.

An additional motivation for attributions is that of a just world hypothesis. The hypothesis stems from the universal belief that society and the world are fair, therefore "people generally get what they deserve and deserve what they get" (Ramos, Correira & Alves, 2014, p.257). This concept proposes that for people to maintain their belief that the world is orderly and fair, they may often diminish the victim and convince themselves that they were responsible for the negative event that took place (Lerner & Miller, 1978; Kelley & Michela, 1980).

Differences in observers and actors' attributions

Observers can be defined as individuals that attempt to understand other people's behaviour and actors as individuals who attempt to understand their own behaviour (Malle, Knobe & Nelson, 2007). Two main groups of factors have been recognised as possibly influencing actor-observer differences, namely: 1) cognitive factors and 2) motivational factors (Kelley & Michela, 1980; Jones & Nisbett, 1972).

With regard to cognitive factors, the individual observing the event/behaviour, usually has a limited amount of information about the actor's behaviour in certain situations, while the actor has a vast amount of information about their own behaviour in different situations. Therefore, the individual observing, may be quick to assume that there is consistency in the actor's behaviour and attribute the behaviour to inherent traits of the actor (Kelley & Michela, 1980). Conversely, the actor will perceive the causes of behaviour to be due to situational variables instead of dispositional attributes (Nisbet, Caputo, Legant & Maracek, 1973).

The second aspect that was recognised to influence the differences amongst observers and actors is motivational factors. Actors and observers have varying interests in the manner in which events/behaviours are inferred. The actor is interested in receiving recognition for positive outcomes and avoiding the blame attached to negative consequences (Gibson & Schroeder, 2003; Lester et al., 2002; Kelley & Michela, 1980).

The two factors give a limited explanation for the differences between actors and observers. Some researchers propose that the observed differences between actors and observers may be the result of the accurateness of the attributions made. The actors would have more information

on the event/behaviour and therefore their attributions should be more accurate (Monson & Snyder, 1977).

2.7.2 Consequences

The focus of researchers in this section was on understanding the effect of attributions on cognitive processes, affect and behaviour (Ball, 2013; Stoeber & Becker, 2008; Rees et al., 2005a). A lot of emphasis was placed on how attributions affect future expectations for success and goal achievements.

The extent to which an actor is liked and trusted is usually based on whether the actor's action is attributed to him/her or the environment. For example, a good act is more appreciated if is attributed to the internal rather than due to external influences (Kelley, 1972). Conversely, negative and harmful actions are better accepted when justified by external influences rather than if the actions were attributed to the internal factors of the actor (Kelley, 1972).

Studies have been conducted to see the effects of surveillance over workers by supervisors (Strickland, Barefoot, Hockenstein, 1976). It was noted that workers who performed well without supervisor surveillance enjoyed more trust than those who performed at a similar level with supervisor surveillance. This is because the performance of the worker under surveillance was attributed to external influences because the motivation to perform in his work is not clear as indicated by the discounting principle. As mentioned previously, the discounting principle can be described as the tendency of people to reduce the role played by a certain probable cause (i.e. intrinsic motivation) in the event where other probable causes exist (i.e. surveillance). Therefore, according to the discounting principle, workers who are not under surveillance by their supervisors will enjoy more trust because the supervisors will attribute their performance to intrinsic motivation because other probable causes do not exist at the time such as 'feeling the pressure to perform because of surveillance' (Strickland et al., 1976). In addition to this finding on worker surveillance and trust, supervisors were also noted to place higher surveillance on the workers who were already under surveillance than those who were not during periods of strain and tight deadlines, further displaying the lack of trust placed on the worker (Strickland et al., 1976).

The concepts of skill and chance have been explored under the scope of achievement attributions. Phares (1957) discovered that individuals who were told that their failure on a judgement task was due to chance instead of skill, resulted in the individuals having higher expectations to

succeed in the future. Also, when individuals who succeeded were told that it was the result of skill instead of chance, the individuals performed better (Phares, 1957).

Weiner (1972) further explored achievement by constructing a two-dimensional model consisting of stability and locus of control. Stability refers to the consistency of a 'cause'. For example, an individual's level of ability is consistent over time and, therefore it is referred to as stable and effort can vary depending on the circumstance, therefore it is referred to as unstable. Stability can be broken down into stable-unstable and locus of control into internal-external. Locus of control refers to the degree to which an individual has control over a cause, for example, one can have control over how they apply their skill and talent, however, 'luck' is not within their control. As demonstrated in Table 2, task difficulty is external and stable, and luck is external and unstable (Weiner, 1972). The other causes can be classified using the model (see Table 2).

Table 2: The two-dimensional attribution model by Weiner (1972) (Adapted from Wilcox, 2015).

		Locus of Control	
		Internal	**External**
Stability	Stable	*Ability*	*Task Difficulty*
	Unstable	*Effort*	*Luck*

Weiner (1979) found that the stability of the inferred causes played a more significant role than locus of control when it comes to expectancies for future behaviour. In the earlier works of Weiner, Heckhausen and Meyer (1972), it was predicted that emotional responses such as guilt for negative outcomes and pride for positive outcomes were intensified when attributed to the internal (Weiner, Heckhausen & Meyer, 1972).

The research study by Caroll (1978) demonstrated that attributing events to unstable factors can result in the actor receiving a less severe punishment because there will be an expectation that the event is less likely to occur in the future.

The theories that form the foundation of attribution have been discussed to give the reader a good understanding of attribution theory. The next section of the literature review will explore attribution theory and incidents in the workplace.

2.8 Attribution Theory in the Workplace

Attribution theory has been well cited in organisational literature in topics such as accident causality, social-event causality and risky behaviours in employees (Gyekye, 2010). Classic examples of attribution research in this area includes Woodcock's (1995) work on workplace accidents and Hale and Glendon's (1987) 'model of behaviour in the face of danger'. The theory has also been used in the process of constructing decision making policies concerned with the recruitment, selection and termination of workers (Ashkanasy, 1995; Colwill & Perry, 1992).

The application of attribution theory has aided researchers and professionals to clarify the causes of incidents in organisations and has resulted in the development and implementation of appropriate safety and management policies (Gyekye, 2010). As mentioned previously, incidents, specifically new ones that result in bad outcomes cause people to explore the cause and purpose of those incidents and triggers defensiveness in those involved in the incident. This search or exploration to find the causal explanations is done through the attribution process. Since the information gathered to develop safety management policies is the same information obtained in incident reports outlining subordinate workers and supervisors' accounts of the incident, it can be said that their attributions of the incidents inform policies (Dejoy, 1994, 1990). Therefore, attributions are central to the development of effective safety management policies.

Workplace incidents are commonly attributed to two main causes: dispositional traits of the employee (internal factors) and environmental causes (external factors). Subordinate workers who are usually the perpetrators of the incidents commonly make external attributions for incidents whilst supervisors commonly make external attributions (Gyekye, 2010). Gyekye (2010) developed an exemplary list of internal and external causal factors that subordinates and supervisors commonly attribute incidents to, to give readers a good understanding of the factors discussed (See Table 3).

Table 3: Internal and external causal factors for incident causation (Gyekye, 2010, p.408)

Internal Causal Factors	External Causal Factors
Lack of skill	Low wages
Professional pride	Time and trouble saving
Attentional lapse	Work overload
Misperception	Defective equipment
Misconduct	Inadequate training
Lack of adequate comprehension	Pressure from management
Risky work behaviour	Co-worker's fault
Inexperience	Operational procedures
Carelessness	Miss-assignment

Urge to show off Ignorance Sense of job security Mood 'had a bad day' Tiredness and exhaustion Deliberate, wilful violation	Curse, spell or witchcraft Religious faith Poor housekeeping Lack of appropriate gear Ambiguity and task difficulty

2.8.1 Hierarchical Level: Supervisors And Subordinate Workers

Hierarchical level in the organisation has been shown to have an effect on individuals' attributions concerning workplace incidents (Turbiaux, 1971). Supervisors are inclined to use internal explanations that place the blame on the subordinate in question (Dejoy, 1987). Numerous studies by Dejoy (1987); Hamilton (1986); Mitchell and Wood (1980) and Salminen (1992) have demonstrated this notion. Research has also shown that when supervisors assigned internal attributions to incidents this often resulted in punitive consequences for the subordinate workers, especially in the case of serious incidents and organisations with punitive cultures, therefore subordinate workers and supervisors make defensive attributions to avoid responsibility and blame for the incident (Shaver, 1970; Gyekye, 2010).

Kouabenan, Medina, Gilibert and Bouzon (2001) observed an interaction between gender` and hierarchical position. Male supervisors were found to be more prone to making internal attributions than female supervisors. Another factor that could influence supervisors' tendency to make internal attributions is social status and education. Individuals with a high social status and higher education level have been reported to be more prone to making internal attributions. Therefore, it can be argued that since supervisors enjoy a higher social status in the organisational context and the position requires higher educational qualifications, these factors could be influencing their inclination towards making internal attributions (Beauvois, Gilibert, Pansu, & Abdellaoui, 1998). The difference in the two groups can also be influenced by demographic factors, interpersonal factors as well as organisational factors which will be discussed below.

2.8.2 Age

The age of workers has been shown to have a significant effect on their causal attributions. Studies by Salminen and Gyekye (2007), have revealed that 'older subordinate workers' are prone to attributing workplace incidents to external factors more than their younger subordinate workers. The same variable was also considered in supervisors, where it was found that older supervisors were more prone to attributing bad performance of subordinates on external factors than younger supervisors (Gyekye, 2010). These research findings by Salminen and Gyekye

(2007) correspond with the findings of other researchers such as Niza, Sila and Lima (2008), in that younger workers perceived the cause of workplace incidents to be due to (internal) organisational factors and older workers perceived the incidents to be due to unexpected (external) events (Gyekye, 2010).

2.8.3 Worker Experience

Worker experience was also found to make a difference in how workers make causal attributions in the workplace. More experienced workers were found to be more prone to making external attributions such as environmental factors for poor performance by their subordinates (Gyekye, 2010). This was also observed in supervisors who were categorised as more experienced workers. Less experienced workers were found to make internal attributions for poor performance (Gyekye, 2010).

Co-workers who find themselves to have similar values, beliefs, and personal characteristics to the workers who allegedly caused the incident have been found to often take a protective stance by attributing the cause of the incident to external factors (Gyekye, 2010). The researchers theorised that this observation could be due to the workers considering their own vulnerability and the possibility of facing the same challenge as the "victim" of the incident in the future (Gyekye, 2010). When making responsibility attributions on a co-worker who was situationally relevant (doing a similar job with the same tools, etc.) or personally relevant (beliefs, values, gender, etc.) to themselves, the workers assigned less responsibility for the accident and vindicated them for the blame in comparison to non-relevant workers (those who have nothing in common with them).

2.8.4 Cultural Background

Research has shown that cultural orientation can also have an effect on the attributions of workers in workplace incidents. In his study on individualistic Finnish workers, Gyekye (2001) found that the individualistic workers were more likely to make internal attributions for incidents than external environmental attributions (Gyekye, 2001). On the other hand, collectivistic workers from Ghana were more likely to attribute accident responsibility to situational or contextual factors (Gyekye, 2001). According to Markus and Kitayama (1991), there are two types of self-construal, the interdependent which can be found in collectivistic cultures and the independent which is found in individualistic cultures. People from individualistic cultures with an independent self-construal, strive to be different and separate from others (Markus & Kitayama, 1991). Self-construal refers to the degree to which an individual 'the self' describes themselves

interdependently or dependently with others (Cross, 2015). They tend to prefer and emphasise their personal values and internal attributes. Their self-esteem is affected by their ability to be autonomous and distinct (Tafarodi & Walters, 1999; Markus & Kitayama, 1994, 1991). Contrary to this, people from collectivistic cultures with an interdependent self-construal emphasise the importance of having good interpersonal relationships, in-group harmony and conformity to social norms (Kwan, Bond, & Singelis, 1997). People who have an interdependent self-construal are more prone to sacrificing their individual goals for the sake of the collective as maintaining a harmonious relationship with the group as a "source of self-esteem" (Gyekye, 2006, p.3; Kwan, Bond, & Singelis, 1997). It is important for people in collectivistic cultures to feel like they belong (Gyekye, 2006). The different types of self-construals suggest that people from different cultural contexts will analyse situations or events such as incidents differently (Gyekye, 2006).

The above section discussed the various factors that affect workers and supervisors' attributions. The following subsections will explore the organisational factors that play a role in incident causation as these factors together with the workers and supervisors' attributions of incident causation play a role in informing the safety policies of the organisational.

2.8.5 Safety Culture

Organisations have shown an increased interest in workplace safety and safety culture over the past few decades (Cooper, 2002). This interest was sparked by the accident report findings of the Chernobyl nuclear plant accident which took place in the year 1986. An analysis of the Chernobyl accident found that the cause of the accident was due to the lack of a safety culture because more emphasis was placed on cost-saving and efficiency than it was on safety in the highly competitive environment (Wiegmann, von Thaden & Gibbons, 2007; Cantino; 2008). The findings of the accident analysis highlighted the importance of analysing the safety culture of organisations in high risk industries as this can help organisations to prevent future accidents by finding and addressing safety risks in time (Bentley & Tappin, 2010). Following the Chernobyl nuclear plant accident, the International Nuclear Safety Advisory Group (INSAG) recognised and defined 'safety culture' as an organisational culture that is focused on safety above all else (Cooper, 2002).

In order to understand 'safety culture', one must first understand the meaning of 'culture'. Culture can be described as the shared patterns, beliefs, norms and values that are related to certain groups (Choudhry, Fang & Mohamed, 2007; Wiegmann et al., 2007). In an organisational

setting, this concept is referred to as organisational culture and can be described as the attitudes, perceptions, norms and values that are adopted by the organisation and used as guidelines for informing company policies and how employees should behave and approach all organisation related issues and events. Therefore, a safety culture will mean that the norms and values of the organisation will all be centred on health and safety and the improvement and maintenance thereof and all organisational members will have a shared belief in safety being a priority in the organisation (Choudhry et al., 2007; Wiegmann et al., 2007).

There has been some research conducted to identify whether safety culture exists in an organisation. Organisational indicators and measurement tools such as the Human Resources Performance model and the Balance Score-card approach have been developed although researchers found that safety culture measurement tools cannot be generalised as each industry and workplace will have its own specific safety requirements (Bentley & Tappin, 2010; Geldenmund, 2000; Coyle, Sleeman & Adams, 1995). To help the reader to gain a practical understanding of safety culture in an organisation, the global safety culture indicators by Wiegmann et al., (2004) and the Health and Safety Executive (HSE) (2014) will be discussed.

The safety culture indicators are as follows: 1) organisational commitment; 2) management involvement, 3) employee empowerment, 4) reward systems and 5) reporting systems (Wiegmann et al., 2004) and two indicators added by the United Kingdom (UK) Health and Safety Executive (2014): 6) mutual trust and 7) competent workforce.

In this section of safety culture, the indicators will be briefly discussed to enable the reader to understand the concepts as they will be further explored in the discussion of the results.

1) Organisational commitment refers to high level management's efforts to ensure that the right resources are provided, and the appropriate working conditions are promoted in order to develop and implement safety measures in all aspects of the organisation.

2) Management involvement looks at the extent to which management is involved in safety activities and supervision.

3) Employee empowerment deals with equipping the employee with proper training and information needed for them to contribute towards safety in the workplace.

4) The reward systems indicator looks at whether management rewards employees who commit safe acts and fines employees who commit unsafe acts as part of their formal organisational policies.

5) Reporting systems should encourage information sharing with regard to all safety issues in order to enable a learning culture in the organisation. A learning culture will be briefly discussed later in the chapter as this concept is central for creating a safety culture in organisations.

6) Mutual trust, refers to the organisational members' ability to speak out about safety issues without fear of persecution, meaning that there is a just culture in the organisation and trust between everyone within the organisation (Wiegmann et al., 2004; HSE, 2014).

The last indicator looks at 7) competent workforce, which refers to the ability of the workforce to perform their tasks at the appropriate standard.

According to Wiegmann et al., (2004), when all the safety indicators are present, a safety culture can exist within an organisation. Safety culture can influence the way in which employees perceive safety policies in the organisation, and this is referred to as the safety climate, which will be discussed in the following section.

2.8.6 Safety Climate

As mentioned in the previous section, safety climate refers to individual workers' perceptions and attitudes with regards to the safety policies and procedures in the organisation. The concept of safety climate is focused on the individual as opposed to the organisation. An employee's attitude can either be negative or positive when it comes to issues of safety and this in turn influences the safety behaviour of that employee and their tendency to cause accidents and incidents (Clarke, 2006). A study by Clarke (2006) found a high correlation between attitudes and perceptions and behaviour. Individuals who exhibited safe behaviour were found to have positive attitudes and perceptions and just like safety culture, safety climate is affected by the values and safety policies and practices of the organisation. As discussed above, safety climate focuses on the individual, however there has been a shift in organisational safety studies towards analysing accident causation from a systems perspective (Abdel et al., 2014; Garret & Teizer, 2009; Haden, 2009; Reason, 2000).

2.8.7 Just Culture

As mentioned earlier in the chapter, safety culture is a central part of an organisational culture in organisations, specifically in high risk industries. Four sub-components of safety culture have been proposed in workplace safety literature. These are a just culture, reporting culture, flexible culture and learning culture (Jeffcott, Pidgeon, Weyman & Walls, 2006; Global Aviation Information Network [GAIN], 2004; Reason, 1997). Workers and supervisors' accounts of

incidents are an essential part of the process of determining blame-worthy behaviour and assigning responsibility for incidents. The information given by workers and supervisors determines the development of safety policies and practices and should therefore be as accurate as possible (GAIN, 2004). Unfortunately, due to the blame culture that exists in organisations, workers and supervisors do not give accurate accounts of incidents because of lack of trust and fear of punishment (Clarke, 2011; Dekker, 2007; Laursen, 2007; Brown & Hicks, 2009). A just culture can help to eliminate these challenges by establishing an environment of trust and therefore improving the accuracy of reporting (GAIN, 2004). Good reporting systems lead to a reporting culture in the organisation which offers the benefit of unlimited data which can be accessed to develop safety policies and practices and educate employees. When an organisation is able to effectively and continuously learn from accidents and errors, it can be described as having a learning culture.

David Marx was the first researcher to develop the notion of a just culture as part of his work at a risk management company in the year 1997. He was concerned with learning more about systems and behaviours within the system. During this process, Marx exposed flaws, weaknesses and human errors in the system with the intention of studying them and improving them (Pepe & Catalado, 2011). The concept was later developed by researchers such as James Reason (2000; 1997) and Sidney Dekker (2009; 2007) with the use of a 'just' approach to accountability and human error in occupational safety studies. The notion of a 'just culture' is mostly used in high risk industries like nuclear power, maritime and aviation (Pepe & Catalado, 2011).

A just culture lays the foundation for a reporting and learning culture. A just culture facilitates a supportive environment, promotes trust and open communication in an organisation. In addition, it clearly outlines what unacceptable and acceptable behaviour is (Khatri, Brown & Hicks, 2009; GAIN, 2004). In an organisation with a just culture, employees can openly express their views, concerns and report on accidents without fear of being blamed or punished because of the established trust and ethical nature of the organisation (Khatri et al., 2009; Pepe & Catalado, 2011).

2.8.9 Blame Culture

Blame culture can be defined as "a set of norms and attitudes in an organisation characterised by an unwillingness to take risks or accept responsibility for mistakes because of fear of criticism or management astonishment" (Khatri, Brown & Hicks, 2009, p.314). An organisation with a blame culture is concerned with finding the guilty party and often assigns blame for accidents to

human error and negligence. This type of organisation prefers to deal with accidents through a disciplinary process where employees can be terminated or even prosecuted (Clarke, 2011). The constant punishment of employees breeds an environment of fear and mistrust in the organisation, resulting in incomplete or no information from employees with regards to accidents. These measures are used by the employees as an attempt to avoid punishment (Dekker, 2007; Khatri et al., 2009).

2.9 The Systems Approach

The 'systems' approach has been utilised to analyse safety incidents and accidents taking place in dynamic and complex situations over the past few decades (for example Reason, 1990; Rasmussen, 1997; Salmon & Lenne, 2009). In this approach, safety is not only seen as an issue for workers and supervisors, but it is the responsibility of all the stakeholders within the complex socio-technical system, i.e. the stakeholders within the organisation. Further, this approach looks at safety as a component in a larger system instead of isolating it as an issue stemming from human error. In other words, it is assumed that accidents are caused by pre-existing and underlying issues and moves the focus from human error (Reason, 1990). In the context of a port terminal, the Crane Operators will not be presumably identified as the primary cause of the accident, but the crane incident will be seen as a consequence of underlying issues within the port terminal.

There has been a change in Occupational Health and Safety studies over the past few decades where researchers have taken a holistic view of incidents and accidents. As mentioned above, the approach looks at various factors within the individuals themselves and the environment; and the interactions of those factors in order to have a more complete understanding of the observed outcome. A system refers to a complex structure consisting of different parts which connect and interact across a number of levels in an organisation, all with a common purpose. These components include machinery, people, policies and the environment within an organisation (Wilson, 2012).

Previously, the literature on Occupational Health and Safety was person-centred, where safety issues such as accidents were attributed to the characteristics and behaviours of the individuals involved (Garett & Teizer, 2009; Holden, 2009). Human error was seen as the common cause of accidents due to the inherent traits that exist in humans such as carelessness, negligence, inattention and forgetfulness. This resulted in organisations focusing their efforts on correcting people's behaviours (through discipline) and recruiting people who portrayed the 'right'

behaviours (Holden, 2009; Reason, 2000). Thus, this approach resulted in a lot of blame and the implementation of disciplinary procedures in organisations. As mentioned above, in the discussion on blame culture, blame culture prevents organisations from learning and progressing because this diverts the attention from the real causes, leaving the organisation vulnerable to further accidents and incidents (Holden, 2009).

Within this approach, researchers also consider the context in which the action or event took place. The context is also referred to as a socio-technical system. A system that consists of the socio aspect such as government policies, public opinions and the physical and organisational environment, the job factors, personal factors and the technical consisting of equipment, machinery, etc. (Wilson, 2012). In the socio-technical system of the port, the main factors which affect the performance of the Crane Operator are the task / job factors, physical environmental / internal environmental factors, which are referred to as the organisational factors in the study; and personal factors. Separate questions were asked with regards to physical environmental and internal environmental factors as the two factors focused on two different types of 'environments'. The 'environment' refers to the external and physical environment at Port X. For example, wind and weather conditions. Organisational factors refers to the internal environment of the organisation, for example, the safety culture (Maritime Injury Centre, 2017).

The sociotechnical system of the port also includes the various workers who perform different tasks. The Crane Operator operates the crane to move containers to and from the ship. The hatch men assist the Crane Operator by ensuring that the containers are removed and placed safely within the hatches of a ship. Stevedoor is a term used to describe all the other workers who assist with operations on the dock. It is important that all the workers who work on the dock are considered when assessing crane incidents as they are part of the socio-technical system.

Systems thinking is not only necessary, but vital in an organisation such as a port terminal which is made up of a vast number of components which all play a role in achieving the purpose of the organisation. Although there has been an increase in using the systems approach in occupational health and safety and the transport sector, there has been a limited application in the maritime industry and in the study of crane incidents.

The literature review gave a detailed explanation of the different theories that make up attribution theory, to help the reader gain a solid understanding of the theory before reading about its application in the following chapters. Despite the significant amount of dated literature cited in the review, the reader is still able to realise its relevance and will be able to understand its

application in the current study. Further, the review highlighted the differences in supervisors and subordinates and amongst workers when it comes to making attributions in the workplace based on factors such as demographics, culture and relationships with the actor. Finally, the literature review explored the type of culture that will be conducive for a safe organisational environment as well as the most effective approach to analysing organisational incidents and accidents by adopting a systems thinking approach.

2.10 Research Questions

Based on the literature review it is expected that Crane Operators will have different perceptions of crane incidents to Crane Supervisors. This is because according to attribution theory, the differences in work related experiences between Crane Operators and Supervisors as well as other factors such as cultural backgrounds, work experience and gender to name a few, can result in discrepancies in their perceptions of a specific incident. It is also expected that task/job factors, environmental/organisational factors and personal factors will also play a role in the attribution of incidents for both Crane Operators and Supervisors as they form part of the socio-technical system at the port.

To address the research topic, "applying attribution theory to Crane Operators and Supervisors' perceptions of incident causation", the following research questions were constructed:

a. What task/job factors do **Crane Operators** attribute to incidents?
b. What environmental/organisational factors do **Crane Operators** attribute to incidents?
c. What personal factors do **Crane Operators** attribute to incidents?
d. What task/job factors do **Crane Supervisors** attribute to incidents?
e. What environmental / organisational factors do **Crane Supervisors** attribute to incidents?
f. What personal factors do **Crane Supervisors** attribute to incidents?

The following Chapter will detail the methods used during the current research study.

CHAPTER 3: METHODS

3.1 Introduction

As discussed in chapter 1 and 2 of the research study, the aim of the current study is to analyse and compare Crane Operators' and Crane Supervisors' perceptions of incident causation by the application of attribution theory. The application of attribution theory to incident analysis can create an understanding of how incident attributions are developed and are affected by individual and organisational factors, thus helping organisations to come up with more effective methods of incident investigation. The purpose of this chapter is to give a description of the methodology utilised to address the research questions and aims discussed in chapter 1. Furthermore, the detailed description of the methods used in the research study will enable thorough understanding of the procedure and methodology and replicability of the study. The selected research design was informed by the research question and the methods chapter will include the following topics: research design, research paradigm, research strategy, sampling strategy, data gathering, data analysis and ethical considerations.

3.2 Research Design

Research design can be defined as a plan which is developed by the researcher in order to guide the research process (Marshall & Rossman, 1999). A research design consists of the procedure, research setting, sample, data analysis and the ethical considerations that the researcher includes as part of the research process (Green, 20014). The most important aspect to consider when designing a research project is to select the most appropriate method for addressing the aim of the study (Gurney, 2010). Figure 1 below illustrates the elements of a research design.

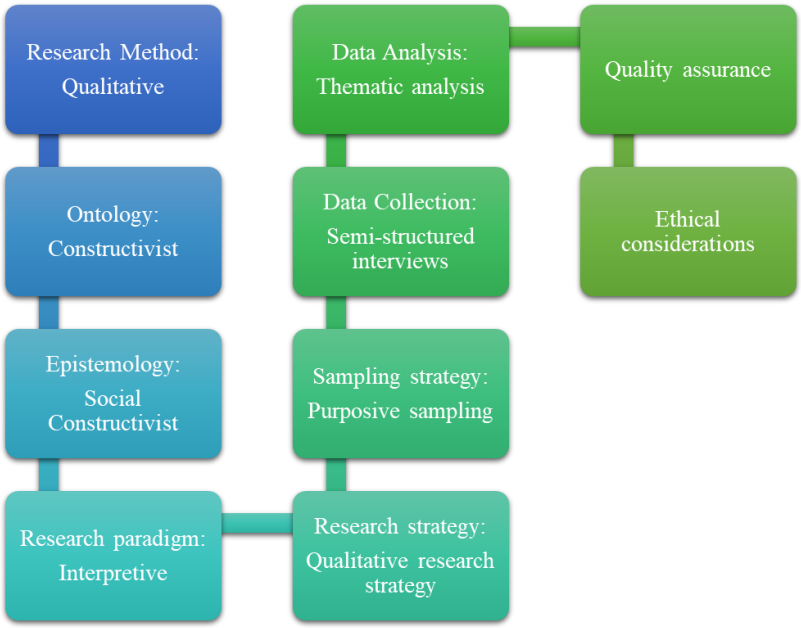


Figure 1: Elements of the research design as adapted from Lotter (2015).

3.3 Research Method

Research methodology is made up of strategies that researchers use in order to ensure that other researchers are able to evaluate, repeat and sometimes modify the research study (Lapan, Quartaroli, & Riemer, 2012). The research method selected for this study is the qualitative research approach, as it allows the researcher to collect rich and in-depth data from the participants. Qualitative research can be defined as an "emergent, inductive, interpretive and naturalistic approach to the study of people, cases, phenomena, social situations and processes in their natural settings in order to reveal in descriptive terms the meanings that people attach to their experiences of the world" (Yilmaz, 2013, p. 312). The process of immersing one's self in the context or natural setting in which the participants come from, allows the researcher to understand the actions and motivations of the individual participants (Myers, 2013). Therefore the qualitative research approach enabled the researcher to derive the perceptions of Crane Operators and Crane Supervisors with regards to crane incidents through verbal accounts of the two parties while visiting the participants at the port, their place of work.

3.4 Research Philosophy

Research philosophy can be described as the beliefs guiding the way in which the data should be collected, analysed and utilised when studying a phenomenon (Singh, 2015). Two main research philosophies are recognised, namely, interpretivist and positivist (Galliers, 1999; Singh, 2015).

The following section will discuss the current study's research philosophies in relation to ontology, epistemology and research paradigm.

3.4.1 Ontology

Ontology is concerned with individuals' beliefs about the world, in other words, what they believe to exist and to be true about the world (Ritchie, Lewis, Nicholls & Ormston, 2014; Fleetwood, 2004).

In the current research study, the constructivist ontology was used. This type of ontology is also described as relativism, which proposes that the concept of 'reality' is relative to each person and is socially constructed, meaning that 'reality' is formed through situations/contexts and different types of interactions with people (Ponterotto, 2005; Guba & Lincoln, 1994). The constructivist ontology was helpful in allowing the researcher to understand the interaction between the context, motives and behaviours of the Crane Operators and Crane Supervisors.

3.4.2 Epistemology

Epistemology is similar to ontology in that both concepts are concerned with beliefs. An epistemology explains the researcher's beliefs about the source of knowledge and also describes how the researcher will find this knowledge (Stroud, 2011; Van Gigch, 2002; Baptiste, 2001). It is important that the source of knowledge that the researcher finds produces answers for the current study's research questions (Baptiste, 2001).

The current research study adopted the social constructionist epistemology where an individual plays an active role in constructing their reality (Jacobs & Manzi, 2000). This epistemological stance views the individual as someone who is actively involved in how they perceive reality and they construct this reality through social interactions and interpretation. Therefore, this epistemological approach is relevant for the current study because it enables the reader to understand that the verbal accounts of the participants are influenced by their knowledge, the way in which they process information and their view of the world (Saldana, 2011).

3.4.3 Research Paradigm

A paradigm guides the way in which things are perceived, valued and processed in line with a "particular vision of reality" (Harmon, 1970, p. 5). In other words, a paradigm is a set of beliefs that guides the way in which the researcher perceives behaviours and actions and therefore also guides the researcher's actions during the research process (Denzin & Lncoln, 1994).

The most suitable paradigm for the current study is that of interpretivism, since this type of paradigm can allow the researcher to gain a deep understanding of the perceptions of the different participants in the study, i.e. Crane Operators and Crane Supervisors in relation to crane incidents that take place at the port. This interpretive paradigm proposes that individuals create their own reality of the world, meaning that different individuals can have different realities or views of the same thing (Grbich, 2013; Gruninger, Bodenreider, Olker, Orbst & Yim, 2008). The interpretive paradigm can enable the researcher to acquire a deep understanding of individual perceptions because the paradigm acknowledges that the realities individuals construct for themselves are influenced by cultural factors, life experiences and the environment in which those individuals exist (Willis, Jost & Nilakanta, 2007). Research shows that an individual's reality has the ability to change based on their context (Sergi & Hallin, 2011). Therefore, the interpretive paradigm emphasises the influence that context has on how individuals interpret the world.

The researcher, undertook this research study with the understanding that their own reality is a social construct that has been shaped by their beliefs, life experience and contextual factors such as cultural background and environment. Further, the researcher has the understanding that the individuals participating in the study have their own constructed realities which may differ from those of other participants as well as their own. The interpretive paradigm aims to provide insights, descriptions as well as justifications during the formation of a theory. Therefore, this paradigm enabled the researcher to make sense of how contextual factors can influence the perceptions of Crane Operators and Crane Supervisors.

3.5 Research Strategy

Research strategies provide the researcher with approaches that should be used when dealing with the different components of the research design which includes the research philosophy, data collection techniques and the analysis of the data (Denzin & Lincoln, 1998). The strategy also takes into consideration the methodological practices and paradigms which are appropriate for the selected design (Creswell, 2009). Therefore the research strategy guides the manner in which the research design is completed.

3.5.1 Qualitative Research Strategy

A qualitative research strategy was selected in the current research study. Qualitative research focuses on the observation of subjects in their natural setting. Researchers use various strategies for qualitative research such as phenomenology, case studies, ethnography, grounded theory,

biographical approach, narrative research and participatory action research to name a few (Gray, 2014; Denzin & Lincoln, 2000). In the current research study, the researcher made use of the narrative research approach where semi-structured interviews were used to collect the data.

The qualitative research approach was developed by researchers who had an interest in understanding human behaviour and this approach has enabled a more in-depth understanding of the topics within social sciences (Willig, 2001). Qualitative research can also be defined as a form of social science research that uses methods that are non-numerical in nature as a way of understanding people's perceptions, experiences and actions (Willig, 2001). Willig's (2001) description of qualitative research is similar to that of Heider (1958) in that both researchers highlight how the research approach and the theory of attribution are concerned with understanding how people make sense of the world.

Qualitative research studies aim to find the differences that exist in the population in relation to a specific research topic (Jansen, 2010). Therefore, the researcher's aim was to analyse the differences in the perceptions of the participants in the selected sample groups. In addition, researchers are required to interpret the collected data in a manner that is meaningful when conducting a qualitative research study, therefore the differences that are observed in participants should be interpreted in a way that will have meaning in relation to the research topic. A further characteristic of qualitative research that should be noted is that it is conceptual in nature, meaning that information is collected and analysed to enable the researcher to build a theory (Jansen, 2010). In the current study, the researcher will collect and analyse data in order to build a theory on Crane Operators and Crane Supervisors' perceptions of incident causation in a port environment.

Researcher bias can be problematic in qualitative research and debates have taken place on whether or not researcher influence should be controlled and accounted for (Ortlipp, 2008). Qualitative researchers are encouraged to take on a reflexive approach when conducting qualitative research (Ortlipp, 2008). When taking on this approach, researchers should have an internal conversation with themselves regarding their personal beliefs, experiences, choices and actions during the course of the research study (Ortlipp, 2008, Mruck & Breuer, 2003). In line with current recommendations on conducting qualitative research that is transparent and self-reflective, a reflexive journal was kept during the research process (Ortlipp, 2008).

3.6 Sampling Strategy

Sampling refers to the group of participants which are chosen from a wider group/population of people (Flick, 2007). The sampling strategy requires the researcher to choose a group of participants which is representative of the wider group/population in terms of particular characteristics or features (Ritchie & Lewis, 2003).

In order to address the research topic, which is Crane Operators and Crane Supervisors' perceptions of crane incidents, a purposive sampling strategy was used. Purposive sampling can be described as a sampling technique that utilises a sample that possesses specific pre-defined features or characteristics which correspond with the research topic (Guarte and Borrios, 2006). As part of the sampling strategy, the researcher makes use of a small group of participants with pre-defined characteristics to conduct an in-depth study which will enable the researcher to interpret the participants' perceptions (Matthew & Ross, 2010).

In the current research study, the participants were selected according to the targeted population which was Crane Operators and Crane Supervisors in the maritime industry in South Africa. Since the current research study was part of a larger study which was conducted at a specific port in South Africa (Port X), the participants had to be employed at that specific port. Therefore the purposive sample was made up of Crane Operators and Crane Supervisors at Port X. The rationale for using Crane Operators and Crane Supervisors at one specific port is to enable the researcher to compare the perceptions of both groups within the same context/ organisational environment.

A volunteer sample was drawn from the population of Crane Operators and supervisors from Port X in South Africa. It was intended that eight Crane Operators and eight supervisors will be interviewed, adding up to a total of 16 interviews (or until saturation). It should be noted that the sample size was small due to limited access to the operators and supervisors at the port where operations had to continue and were not stopped for this research. This resulted in limited time available for the researcher to conduct the interviews so as to not have any negative impact on safe operations at the port. Staff at the port were not made available to meet with the student either during a break or after or before work due to operational requirements and staff resourcing needs. This resulted in a small sample size so as to ensure that the researcher did not distract interviewees from their work and also not result in delaying any operational requirements for the company. The total number of participants who participated in the study was 16, which allowed for saturation as the same information was repeated by the interviewees. None of the participants

withdrew from the study during the study, enabling the researcher to gain as much access to information as possible. The small sample size was therefore not in the researcher's control, and highlights how conducting work *in situ* can be challenging given the operational requirements of the company. Table 4 below illustrates a summary of the sample used in the current study.

Table 4: Summary of the sample

Participant No.	Position	Age	Perm / Contract	Gender	Ethnicity	Language	Educational Level
1	Crane Operator	44	Perm	Male	Indian	English	Matric
2	Crane Operator	40	Perm	Male	Black	Xhosa	Matric
4	Crane Operator	34	Perm	Male	White	Afrikaans	Matric
5	Crane Operator	29	Perm	Male	White	Afrikaans	Matric
7	Crane Operator	31	Perm	Male	White	Afrikaans	Matric
8	Crane Operator	26	Perm	Male	White	English	Matric
9	Crane Operator	52	Perm	Male	Indian	English	Matric
16	Crane Operator	28	Perm	Female	White	English	Matric
3	Supervisor	40	Perm	Female	Black	Zulu	Matric
6	Supervisor	32	Perm	Male	Black	Zulu	Matric
11	Supervisor	32	Perm	Female	Black	Zulu	Diploma
12	Supervisor	39	Perm	Male	Black	Zulu	Matric
13	supervisor	28	Perm	Male	Black	Zulu	Certificate
14	Supervisor	32	Perm	Male	White	Afrikaans	Certificate
15	Supervisor	30	Perm	Male	White	English	Matric
10	Supervisor	33	Perm	Male	Black	Zulu	Matric

Table 4 illustrates that the study participants were within the ages of 26-52. In the Crane Operator group, the ages ranged between 26-52 and in the Crane Supervisor group, the ages ranged between 28-40. The total sample was racially diverse and somewhat representative of the racial groups in the region of Port X. The total sample included 7 Blacks, 2 Indians and 7 Whites. The total sample consisted of 3 females and 13 males which is representative of gender in the maritime industry in South Africa where women are underrepresented. The Crane Operator sample consisted of 1 female and 7 males and there were 5 White Crane Operators, 3 Indian and only 1 Black Crane Operator. This varied widely with the Crane Supervisor group which consisted of 6 Black Crane Supervisors and 2 White Crane Supervisors. The Crane Supervisor group also consisted of 2 females and 6 males. The participants were multi-lingual, however the

official language used at Port X is English, and therefore the interviews were conducted in English.

The minimum educational requirement at Port X was a Matric/ Grade 12, therefore the minimum educational level of the participants was Matric with only one Crane Supervisor accredited with a diploma.

3.7 Data Collection Methods

There are various data collection techniques that can be utilised when using a qualitative research approach such as fieldwork, interviews and the analysis of documentation (Draper & Swift, 2011). In the current research study, semi-structured interviews were used as the method of data collection.

3.7.1 Interviews

Interviews are used to retrieve information or to acquire the story in qualitative research (Jansen, 2015). Interviews can assist the researcher in obtaining the different perceptions of individuals that come up during the dialogue or conversation that takes place (Harding, 2013).

Different types of interview structures exist in qualitative research, namely 1) structured interviews, 2) semi-structured interviews and 3) unstructured interviews (Evans, 2007). Each type of interview has its advantages and disadvantages and each should be considered based on the objective of the research study. The structured interview is very formal and rigid. With this interview approach, the participants are asked the same set of questions in the same order (Myers & Newman, 2007). The questions are prepared in advance and once the data collection process has begun, the questions cannot be changed (Berg, 2009).

The unstructured interview is completely different to the structured interview in that it is more informal and flexible. With this approach, the participants are given the research topic and they are enabled to lead the interview and discuss anything that they wish to discuss in relation to the research topic (Braun & Clarke, 2013). There are no specific questions prepared and no order of proceedings. Unstructured interviews are open-ended and allow the participants to express their thoughts and feelings freely (Corbin & Morse, 2003).

The last type of interview to be discussed is the semi-structured interview. This type of interview merges the two types of interviews discussed previously, the structured and unstructured. With this approach, the questions are pre-determined, however the way in which the participant

responds is flexible and the researcher is given room to ask probing questions based on the participants' responses. Preparing a set of questions ensures that participants are asked the similar questions in order to acquire the information needed (Bryman, 2004). This interview approach allows the researcher to gain more rich information than they would in a structured interview because they have the flexibility to change the questions as and when needed during the interview (Bryman, 2004).

Figure 2 below illustrates the differences in the interviews on a continuum. The semi-structured interview lies in the middle of the continuum with structured and unstructured interviews on two ends of the continuum.

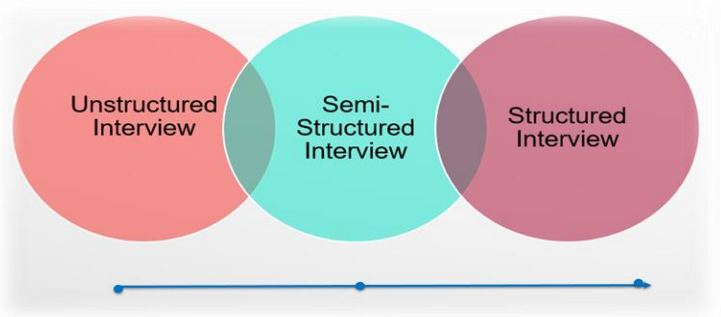


Figure 2: Differentiating interview structures (Adapted from Boeiji, 2010)

Due to the exploratory aim of the current research study, individual face-to-face, semi-structured interviews were used. Semi-structured interviews were advantageous to use in that they enabled the researcher to be more flexible in the way they asked the interview questions (Banister, Burman, Parker, Taylor & Tindall, 2006). During the interviews conducted in the current study, the researcher was able to ask questions based on the flow of the interview whilst still being guided by the prepared interview schedule as found in Appendix E of the Research Report (Banister et al., 2006). This interview approach also enabled the participants to be more open and honest in their communication, thus enriching the data collected (Banister et al., 2006).

Therefore the interviews enabled the researcher to gain a good understanding of how Crane Operators and supervisors perceive crane incidents and their causes through an in-depth dialogue based on the research questions.

3.8 Research Setting

The research setting used in the current study was the workplace setting of the Crane Operators and Crane Supervisors, which was the port. The interviews took place at the different

berths/sections at the port during working hours. The interviews were scheduled according to the participants' availability which was during rest breaks so as to prevent any disturbances to crane operations. The researcher conducted one-on-one, face-to-face interviews in a private room to ensure confidentiality and to allow the participants to speak freely in a 'safe space'. Research shows that there are advantages to studying or observing participants in their natural context, in this current study, the natural context is their workplace, the port. The context enables the researcher to acquire more meaning, or in other words, understanding. This inclusion of the natural setting helps the researcher to arrive at a more specific answer to the research topic.

3.9 Instruments

An interview schedule was used for the semi-structured interviews (See Appendix E). The interview schedule included biographical data as well as questions that established the causal attributions of Crane Operators and supervisors. The themes that the interviews focused on are the various factors that influence people's attribution to incident causation such as cultural context, work tenure, hierarchical level, age, educational level and the relationship to the incident "victim". These themes will help establish the differences in the way Crane Operators and supervisors perceive incidents. A voice recorder was used to audio record the interviews. Careful consideration was taken to avoid any leading questions by asking directive open-ended questions.

Field notes have been found to be a useful data collection method which can be used in collaboration with in-depth interviews where the interviewer audio records the interview (Arthur & Nazroo, 2003). The interviewer is able to take notes on the observed behaviour of the interviewee and to capture their thoughts on the encounter, for use during the analytic stage of the research study (Arthur & Nazroo, 2003). Therefore, field notes were taken during the interviews to allow for the collection of rich data in the study (Arthur & Nazroo, 2003).

3.10 Procedure

The first step of the research was to obtain ethical clearance at the University of the Witwatersrand to ensure that no participants would be harmed and that the research study meets the ethical standards of the university, specifically, the Humanities Faculty. Once the ethical clearance was issued, the data collection process commenced.

Access to the participants was gained through the researcher's research supervisor who was in the process of conducting a study at Port X. Therefore, the Masters research was conducted as

part of a larger study which the research supervisor was conducting. Permission was requested at the Port in order to allow the researcher to conduct further research at the Port. Once permission was granted by Port X, the research supervisor made contact with the team leaders to notify them about the study and to request that they communicate with the Crane Operators about the research study which was meant to be conducted. The crane operations teams were made aware of the research study before dates of the data collection/ interviews.

On the week of the data collection/ interviews, team leaders asked the Crane Operators who were working on the shifts in which the researchers were present, if they were interested in participating in the study. Crane Operators who were interested, were then scheduled to attend the interviews during their rest breaks and Crane Supervisors would avail themselves when convenient. Participants were directed to a private room at the berth where the interview was conducted by the researcher. Before proceeding with the interviews, the reasons for the study were explained and consent was requested to record the interview in order to enable the researcher to focus on the dialogue. Once the interviews were concluded, the recordings were transcribed verbatim by the researcher with the assistance of a transcriber.

3.11 Data Management

It is important that researchers take note of all the insights gained during the research process and that these insights are well recorded and managed (Stake, 2010). A notebook was kept to record field notes and insights gained in order to manage the information efficiently.

Since the method of data collection was interviews, the data had to be captured in order to allow the researcher to analyse accurate information. The interviews were recorded using a voice recorder and the recordings were saved onto a laptop with security password protection. Once the recordings were transcribed, the transcripts were saved into folders with a password security. The recordings and transcripts were only shared with the research supervisor for research purposes.

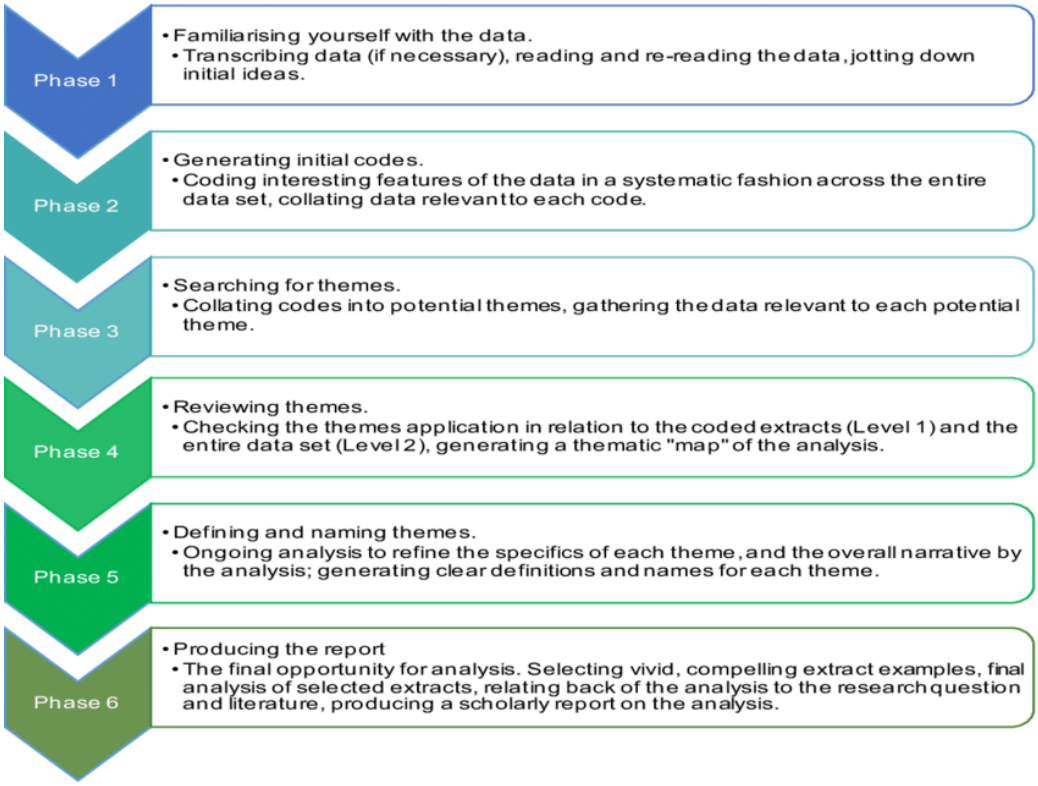
3.12 Data Analysis

As part of the qualitative research approach, the researcher is required to continuously analyse, interpret and integrate the information gathered during the research study (Baptiste, 2001). The purpose of data analysis in a research study is to gain a deeper understanding of the phenomena or the research topic being studied by the researcher (Fosseu et al., 2002). The type of data analysis that was utilised for the current study is thematic content analysis.

The guidelines for thematic content analysis were adopted from Braun and Clarke (2008) and Ritchie and Lewis (2003). This type of analysis is the most preferred form of analysis for qualitative research. Thematic content analysis is compatible with both constructionist and essentialist paradigms and thus allows the researcher the freedom to be flexible in analysing the collected data (Braun and Clark, 2008). This method of analysis involves the identifying, analysing, reporting of themes or repeated patterns across a data set and gathering together examples of those themes from the text (Braun & Clarke, 2008). The emerging themes were then be used to interpret the research topic and research questions. A structured approach with systematic steps was followed in the analysis of the data. Thematic content analysis requires for the researcher to familiarise themselves with the data and to find themes and ideas that are related to the data set and research questions through an inductive approach (Braun & Clarke, 2006). Following the familiarisation of the raw data, indexing of the themes and ideas that were identified takes place (Ritchie & Lewis, 2003). Indexing comprises of drawing up of a list of themes and ideas that emerged from the familiarisation process. The index will guide the researcher to narrow down the main themes that emerged from the data with reference to the research topic (Ritchie & Lewis, 2003). The researcher is vital in the process of 'making sense' of the data as the analysis will be based on their understanding and interpretation of the data and their conceptualising of the themes (Ritchie & Lewis, 2003).

As mentioned previously, the research study utilised the guidelines for thematic content as developed by Braun and Clark (2006). Braun and Clarke (2006) developed a guideline for researchers to use when completing a thematic content analysis which consisted of six stages. The six stages are illustrated in Table 5 below. Theses six stages were followed in the data analysis of the current study.

Table 5: Thematic Analysis Phases as adapted from Braun and Clarke (2006, p.35)



The following section will detail the six stages that were followed in the current study as part of the data analysis process.

3.12.1 Familiarisation with the data

Stage one of content analysis requires the researcher to thoroughly read through the data and to take down ideas that come up as part the familiarisation process. According to Braun and Clarke (2013), it is important for the researcher to ensure that the transcripts match up to the recordings during this stage. In the current study, the researcher familiarised themselves by reading through the transcripts whilst listening to the recordings to ensure that all the data was captured and that any additional verbal expressions were captured. This process was repeated multiple times to allow the researcher to fully immerse themselves in the data. Listening to the recordings while reading through the transcripts aided the researcher to easily comprehend the information. In addition to this, notes were also taken down of any ideas of themes that started emerging during this stage, and where necessary any corrections and additions were added

3.12.2 Generating initial codes

During stage two of the analysis, the researcher should begin to formulate codes systematically and to group the data according to the formulated codes (Braun & Clarke, 2006). In the current

study, the researcher coded the data with the assistance of the research supervisor to decrease errors, increase the accuracy and to manage any bias that the researcher might have (Carey, Morgan & Oxtoby, 1996; Kohlbacher, 2006). Once the researcher was familiarised with the data, codes were developed by looking at similar features in the information and grouping theses similar features together in a systematic way. Once this was complete, a final list of codes was established for the purpose of formulating themes in the next stage of the analysis.

3.12.3 Exploring data for themes

In the third stage of the analysis, the researcher should explore the data and identify themes (Braun & Clarke, 2006). Using the established codes in the previous stage, the researcher began a process of comparing the codes and making links in order to develop the themes. The themes were then grouped together using colour charts that were associated with specific main themes that emerged. During this process, the researcher also considered the significance of other themes that had emerged.

3.12.4 Reviewing themes

During this stage, the researcher reviews the themes that were identified in the previous stage (Braun & Clarke, 2006). In the current study, the researcher reviewed the themes by conducting a cross-check between the codes and themes to make sure that the correct codes were included in the relevant themes. In addition to the cross-checking process, the researcher examined the themes to verify whether some of the themes could be merged to form one theme. The researcher also examined the themes by using Level 1 and 2 coding techniques. Level 1 coding included the reading of all quotes/extracts from the main themes to verify whether a significant relationship exists between the quotes/extracts and the identified themes. The extracts that were found to be irrelevant to the identified themes were removed and placed under the relevant themes or new themes were developed that are suited for the quotes/extracts. During Level 2 coding, the identified themes were critically analysed to determine whether the themes were valid in relation to the data set of the entire study. The researcher finally analysed whether the meanings of the themes were relevant to the research topic. By conducting both Level 1 and 2 coding, the researcher was able to determine whether the codes were linked to the themes and the overall data set.

3.12.5 Naming and defining themes

In the fifth stage of the analysis, the researcher names and defines the identified themes (Braun & Clarke, 2006). During this process, the researcher took care to use the correct terminology used in the maritime industry in South Africa. The labels given to the themes were nouns to ensure consistency and easy comprehension.

3.12.6 Producing the report

During the last stage of the analysis, the researcher reports on the findings (Braun & Clarke, 2006). In the current study, the researcher checked to ensure that there was alignment between the themes and the research questions before commencing with the write up. The alignment of the themes and research questions served as a guideline for the discussion to assist the researcher to answer the research questions/objectives. Extracts from the interviews were also included in the write up to substantiate the findings and to allow the reader to engage with the perceptions of the participants and thus gain a more in-depth understanding of the themes that emerged from the study. In addition, the researcher used the literature in Chapter 2 to develop explanations for the themes and to validate the themes. Additional literature was included in the discussion to further develop possible explanations for the themes and to strengthen the explanations.

The six stages of thematic content analysis as presented by Braun and Clarke (2006) provided the researcher with a simple and effective guideline for conducting the data analysis for the study. The last stage of the analysis concluded the data analysis process of the study. The next section of the methods chapter will focus of the quality assurance of the data.

3.13 Quality assurance of data

Unlike quantitative research, qualitative research is criticised for being subjective and not being scientific. And in contrast to quantitative research, it is not easy to repeat a qualitative research study (Gray, 2014). This brings about questions about the quality of qualitative research studies, such as, how does one assess the quality of qualitative research (Flick, 2006). Guba (1981) proposed that the trustworthiness of data in qualitative research indicates the quality of the research. Furthermore he proposed that there are four elements which determine whether a study is trustworthy, and these are 1) credibility, 2) transferability, 3) dependability and 4) confirmability. There are different types of techniques that can be used to acquire information on whether a research is trustworthy. These techniques are based on the type of research being conducted, for example, different techniques would be used for interviews and document reviews

(Krefting, 1991). Table 6 below provides a summary of the quality assurance strategies used in qualitative research.

Table 6: Quality Assurance Strategies used in qualitative research as adapted from Krefting (1991).

Strategy	Quantitative equivalent	Techniques used
Credibility	Internal Validity	Triangulation, peer review, member checks, etc.
Transferability	External Validity	Sample selection, comparing samples to demographic information, time sample.
Dependability	Reliability	Details on research methods to enable duplication, re-coding, peer evaluation and triangulation.
Confirmability	Objectivity	Triangulation, reflexivity and confirmability audit.

3.13.1 Credibility

When considering the credibility of qualitative research, the researcher should demonstrate that the findings presented are plausible and trustworthy (Tracy, 2010). In addition to this, there should also be a demonstration of the research meeting the objectives of the study (Shenton, 2004). In order to demonstrate credibility, Guba (1981) highlighted member checking, peer debriefing and triangulation as some of the techniques that can be used. Member checking involves the verification of information obtained through interviews (Shenton, 2004). This process of verification is done by verifying the interview data with the participants (Shenton, 2004). Peer debriefing refers to the process of conducting a debriefing session where the researcher answers questions asked by the subject experts in order to verify the credibility of the study (Shaw & Murphy, 2013; Guba, 1981). With the use of the triangulation technique, a variety of methods are used to verify, compare and establish the phenomenon (Schurink, 2009).

In the current study, the researcher verified the data codes in order to ensure credibility. Secondly, various sources of information such as theories and paradigms were used to demonstrate the plausibility of the research findings.

13.13.2 Transferability

Transferability can also be referred to as generalisability or external validity (Lee, Mishna & Brennenstuhl, 2010). It involves establishing whether the findings of the research study could be applicable in other similar scenarios. In qualitative research, the researcher can establish transferability by comparing the current research study with other similar studies however, there isn't a particular method that is prescribed for the interpretation of these studies (Tobin & Begley, 2004). Therefore, in the current research study it was challenging for the researcher to do a comparison with other similar studies, particularly in the South African context. The application of attribution theory to incidents is very limited, with this specific application of attribution theory to incidents yielding no results for the maritime industry in South Africa (Cajee, 2005).

13.13.3 Dependability

Dependability is concerned with the consistency of the results in the study (Lincoln & Guba, 1985). In simple terms, when a study is seen as consistent or reliable, this means that the study should produce the same results if repeated using the same method (Shenton, 2004). During a qualitative research study, the researcher is responsible for ensuring this consistency, and this can be done through the use of various strategies. Some of the strategies that are used by qualitative researchers include stepwise replication, code-recode procedure and peer examination. During the stepwise replication, more than one researcher analyses the data instead of one researcher, and once the data has been analysed be the different researchers, the findings are then compared (Shenton, 2004). With the use of the code-recode procedure, the researcher analyses the data more than once, meaning that they may analyse the data one day and repeat the analysis on another occasion and then make a comparison of the findings. With peer examination, the researcher finds another researcher to check the consistency of the research study by conducting an audit (Shenton, 2004). Another strategy or technique which is often utilised is that of triangulation where the researcher uses various sources of data to compare and verify the findings (Guba, 1981). During the current research study, the researcher used the code-recode procedure to ensure consistency. The researcher was also intending to use triangulation, however, they were unable to obtain the information needed from Port X. In addition to this challenge, information on incidents in the maritime industry is very limited and often not published. Secondly, the researcher ensured that the participants were interviewed under the same conditions. The researcher also used an interview schedule to guide the discussion and

ensure that the same questions were covered during each interview. The methods used in the study were also detailed to enable other researchers to duplicate it.

13.13.4 Confirmability

Confirmability refers to the extent to which the participants' views and context are reflected in the findings of the study. To ensure that the true views of the participants are represented in the findings, the researcher is required to be neutral throughout the process. This means that the researcher should not allow their self-interests, beliefs and intentions to influence the study in any way. Techniques such as triangulation and reflexivity can be used to determine the confirmability of the data (Guba, 1981). Reflexivity takes place when the researcher continuously reflects and asks themselves questions based on the data and findings throughout the research process. This process of reflection allows the researcher to take note of their own convictions/beliefs and self-interests and to consciously separate these from the research process (Mason, 2002).

During the current study, the researcher kept a reflective journal to enable them to remove their convictions/beliefs from the study because the researcher's values and beliefs are a part of them and therefore, part of the research process (Yilmaz, 2013). Therefore the reflective journal was utilised to control for this.

3.14 Ethical Considerations

During the data collection phase of the research study, it is essential that ethical considerations are noted in order to protect the subjects involved from harm (Fouka and Mantzorou, 2011). Ethics can be defined as the guiding principles that a researcher should use to guide their actions during the research process (Bloor & Wood, 2006). According to Fouka and Mantzorou (2011) researchers should consider ethical aspects such as informed consent, anonymity and confidentiality. According to the University process for conducting a research study, the proposal for the research paper was reviewed and approved by the University Ethics Committee to ensure that the study would not harm the participants or subjects in any way. The write up of the research paper was also guided by the University's plagiarism guidelines to ensure that the researcher acknowledges the contributions of other researchers and writers. The following section will discuss the ethical considerations of informed consent, anonymity and confidentiality.

3.14.1 Informed Consent

Informed consent requires the researcher to explain to the potential participant what the study is about and to provide the participants with all related information in such a way that the potential participant understands and can make an informed and voluntary decision on whether they would like to participate or not (Wiles, 2013; Fouka & Mantzorou, 2011). A researcher does not have informed consent if the participants are not really sure what the study entails, in other words, if they do not know what they signed up for (Wiles, 2013). In the current study, the researcher issued all the participants with a consent form which included information about the research study. The consent form informed the participants that participation was voluntary, anonymous and confidential. The participants were also informed that they could withdraw from the study at any point during the research process. Once the participants understood the information provided in the consent form, they would then sign the form to give their consent. A separate consent form was provided to the participants to obtain consent to audio record the interviews. The participants were briefed on the purpose of the audio recordings and on how the recordings would be handled throughout the research process. The participants were also asked to sign the audio recording consent form as consent to allow the researcher to proceed. Therefore the participants provided the researcher with informed consent.

3.14.2 Anonymity and Confidentiality

Confidentiality can be defined as a data management process that is focused on privacy (Boeije, 2010). Confidentiality is also referred to as an ethical principle which informs the researcher to treat the information obtained from participants in such a way that it is kept private from anyone who doesn't have the written consent to see the information (Fouka & Mantzorou, 2011; Esterberg, 2002).

Since the current research study was aimed at understanding Crane Operators' and Crane Supervisors' perceptions of incident causation, the information obtained through the semi-structured interviews was deemed sensitive, and therefore it was essential that the researcher ensured the participants that the data would be kept confidential. The participants were informed that the audio recordings, notes and transcripts would be kept private and that once the audio recordings were transcribed, they would be destroyed to ensure privacy.

The other ethical aspect which is closely tied to confidentiality is anonymity. Anonymity takes place when the identity of the participant/subject is not disclosed (Vainio, 2013). This means that any information that could identify the participants was not disclosed to protect the identities

of the participants. In the current study, the researcher protected the identities of the participants by using numbers as an identifier.

3.14.3 Integrity

The last ethical consideration which will be discussed, is the integrity of the data collected. Evans (2007) states that data should in no way be falsified. This includes tampering with data or using information that was created by the researcher (Evans, 2007). Data collected should be a true representation of the participants' views and should be as accurate and authentic as possible for it to be identified as scientific data (Denzin & Lincoln, 2000). In the current research study, no data was falsified or manufactured to ensure the integrity of the study.

3.15 Conclusion

In this chapter, the methods for the research study were provided in detail to enable the duplication of the study. Secondly, the research method selected for the study, a qualitative research method, was discussed in detail along with the reasoning behind the selection of the method for this study. The data collection process as well as the data analysis process were also discussed and the chapter was concluded with the ethical considerations for the study. The following chapter will provide the reader with the results and discussion of the study.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

The following chapter will report on the findings that emerged from the semi-structured interviews that were conducted on Crane Supervisors and Crane Operators in order to gain an understanding of their attributions in relation to crane incident causation. The purpose of the results and discussion chapter is to firstly answer the research questions that were provided in the introduction, secondly, to demonstrate how the results support the answers provided and thirdly, to demonstrate how the answers relate to the knowledge and literature on the research topic (Ritchie & Lewis, 2003). As mentioned in Chapter 1 of the research paper, the aim of the research study is to analyse and compare Crane Operators and Crane Supervisors' perceptions of incident causation by the application of attribution theory. It was hypothesised that Crane Operators will have different perceptions of crane incidents to Crane Supervisors. This is, because according to attribution theory, the differences in work related experiences between Crane Operators and Supervisors as well as other factors such as cultural backgrounds, work experience and gender to name a few, can result in discrepancies in their perceptions of a specific incident. In the current research study, the Crane Operators are defined as the actors since they are usually the ones operating the crane when a crane incident takes place. The Crane Supervisors are defined as the observers since they are not directly involved in the crane incident and thus view the incidents from a different perspective. As mentioned in the literature review, observers can be defined as individuals that attempt to understand other people's behaviour; and actors as individuals who attempt to understand their own behaviour (Malle, Knobe & Nelson, 2007).

To address the research topic, "applying attribution theory to Crane Operators and Crane Supervisors' perceptions of incident causation", the researcher will attempt to answer the following research questions in this chapter:

a. What task/job factors do Crane Operators attribute to incidents?
b. What environmental/organisational factors do Crane Operators attribute to incidents?
c. What personal factors do Crane Operators attribute to incidents?
d. What task/job factors do Crane Supervisors attribute to incidents?

e. What environmental/organisational factors do Crane Supervisors attribute to incidents?
f. What personal factors do Crane Supervisors attribute to incidents?

The data obtained from the interviews was analysed using thematic content analysis. During the process of thematic content analysis, the researcher made use of both the inductive and deductive coding techniques. The inductive coding technique enabled the researcher to uncover new factors that could have an effect on the attributions of Crane Supervisors and Crane Operators in relation to crane incidents, whilst the deductive coding technique enabled the researcher to confirm whether the findings of the current study aligns to previous literature on attribution theory. The Crane Supervisors and Crane Operators' responses were analysed separately, to allow the researcher to observe and compare the themes that emerged from each category. Therefore the results will be presented in two Tables, each presenting the results of each category respectively. In addition, the narration of the results will be presented for both categories under each theme to allow the reader to compare the two categories seamlessly and to enable the researcher to answer the above-mentioned research questions.

Figure 3 below provides a summary of the themes and sub-themes that emerged from the research study. The main themes that emerged were based on the research questions listed in the introduction and these are: 1) Job Factors, 2) Environmental Factors, 3) Organisational Factors and; 4) Personal Factors. The sub-themes were listed under each theme with the three sub-themes of work relationships, transparency and experience highlighted in bold. These three sub-themes only emerged from the data collected from Crane Operators and will be discussed in relation to the Crane Operators' attributions.

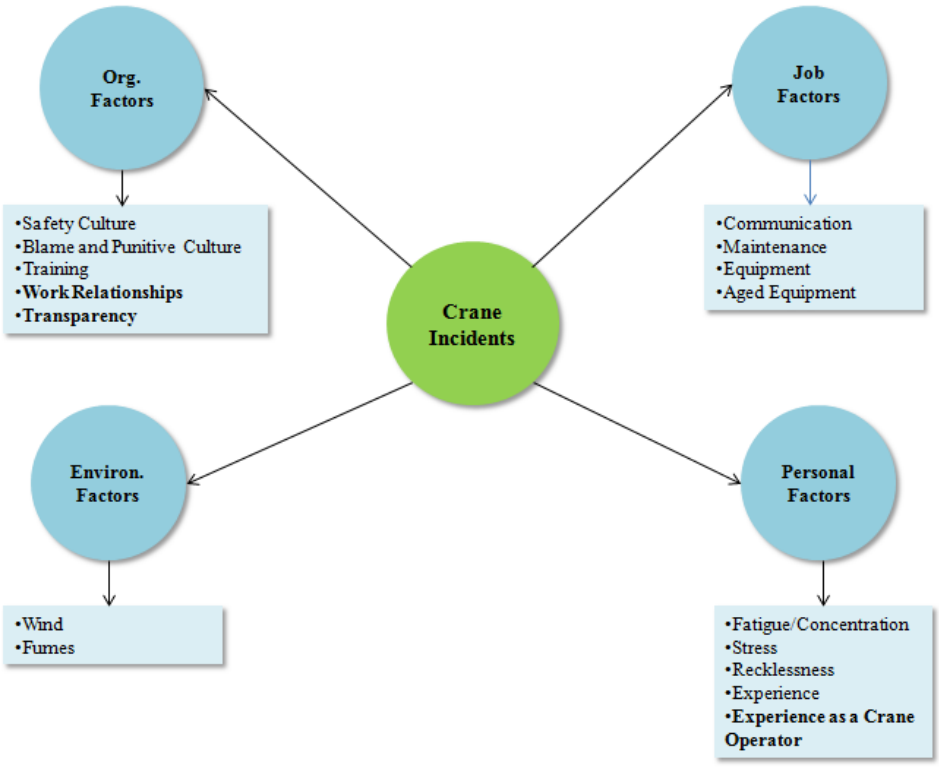


Figure 3: Summary of Themes and Sub-themes

4.2 Report on Crane Operators' and Crane Supervisors' attributions on crane incident causation.

The following section will provide the reader with a detailed report on factors that were identified by Crane Operators and Crane Supervisors as contributing towards crane incidents. The results of the themes that emerged from the two groups, Crane Operators and Crane Supervisors were reported on under the same headings since most of the themes that emerged were common in both the Crane Operators' and Crane Supervisors' data. It should be By presenting the results in this integrated manner, the researcher is able to show the contrast and the similarities in the two groups' responses under each theme and can therefore address the aim of the research study. Three additional sub-themes emerged that were not common to both categories, namely work relationships, transparency and age. These will be discussed separately under each respective theme. The results and discussion of each theme and sub-theme will be preceded by summary Tables of the Crane Operators' and Crane Supervisors' responses for that specific theme which will serve as evidence for the results presented.

Table 7: Theme 1 (Job Factors) – Summary of Crane Operator Responses

Themes (Factors)	Sub-Themes	Brief Description	Quote/Evidence from data
Job Factor	Communication:	A tool for the exchanging of information through various mediums such as speaking (Spaho, 2012).	"So sometimes we tell the guys as well to please be careful on the radio because you sometimes find other people can't hear when you're trying to speak to them." P1 "That's our problem because we are too many on the radio because each and every one we are having the stevedores, we have the straddle, we also have the crane." P2 "I'd say that sometimes it's got 80% to do with that." P4 "So if the hatch man is not communicating with you and he's not awake and he doesn't stop you in time before you touch then you bend the hand railing." P4 "A lot of incidents or accidents happen here because of lack of communication." P5 "Yes if the hatch man isn't communicating properly with the Crane Operator yes definitely." P7 "Yah, especially because we are too many on the radio especially but we try to give each other a gap." P16 "He didn't say anything, well he did say something, well I don't know he was speaking Zulu to the controller under the crane." P5 "This guy was talking Zulu, he thought my partner was still up there." P5 "Communication in Port X is terrible. I understand most employees are Zulu speaking but majority of people if not all that I know can understand English but they choose to speak Zulu." P8 "My controller and my hatch man on my team they talk in Zulu so I'm left in the darkness." P8 "The communication is bad the language barrier is a big problem." P8

			"The hatch man was shouting in Zulu hey whatever stop whatever the case and obviously I didn't know what he was saying." P5 "We battle a lot because there is a lot of hatch men here that can't communicate in English properly" P4 "The language barrier is a problem." P16
	Maintenance	Preserving to maintain a certain condition or state (Manganye & Tlabela, 2008).	"So if they can do the inspection properly and make sure that they give us proper cranes to work with, reliable crane then the incidents will be less." P7 "Third accident came down to maintenance once again." P8 "And the people that service the equipment and the frequency that they service the equipment and then those spreaders, everything comes loose on them." P7 "No one actually came up to find out why the crane cuts off." P8 "That can cause an incident but if maintenance just does their part properly then it won't happen." P16
	Equipment	Physical resources or tools used to equip an individual to perform a task in the workplace (Health & Safety Authority, 2019).	"I spoke to my supervisor that the wind speed meter in my cabin was not working so as much as I could see the wind feels heavy and is blowing boxes, I don't know what the wind speed is so I have to rely on other people" P1 "The twist locks sometimes they jamming and those things they are tightening the boxes some of the guys they are opening but they are not properly opened, that is how we get damage." P2 "They should have contacted the people that actually work on the cranes and they should have asked them what do they want here, and what do you guys feel is the best here, not just do shady deals and get machines." P7 "Some of the vessel, they come damaged, badly damaged." P2

			“We’ve got some challenges of the big vessel some of those challenges ehh because of the height of the boxes.” P2 “Uhm with regards to over heights obviously that’s very risky.” P8
	Aged Equipment		“Our big contributing factor is that we have a lot of delays because of the break-downs due to the age of the equipment.” P1 “Like I said, you get ships that are very old so some of the twist locks are old and they jam so yah.” P4 “Yes I have twice before with the older cranes, the much older cranes.” P4

Table 8: Theme 1 (Job Factors) - Crane Supervisor Responses

Themes (Factors)	Sub-Themes	Brief Description	Quote/Evidence from data
Job Factors	Communication:	A tool for the exchanging of information through various mediums such as speaking (Spaho, 2012).	"The operator will want to communicate with the person in the vessel that they are working with so he can't get through because everybody is talking on the radio the communication is one thing that is the problem." P3 "The driver will come and say I didn't hear the hatch man telling me to stop, the hatch man will say no I told the driver he must stop the driver carried on." P6 "One of the hatch lids is the one that keeps on happening because of no communication proper communication." P6 "They need to do is to listen to the radio so can be able to communicate with the hatch man and a controller that will prevent more accident." P10 "Because I think the major course of this incidents was a poor communication on the part of operators and the Stevedoreing companies." P11 "Hmm I won't say that because we communicate very well I don't see any lack of communication." P12 "There too much guys on the same channel there." P13 "When that driver losses concentration he's trying to change the channel trying to speak to you there's an accident." P14 "A big one is the language barrier… you might end up having an accident so communication there needs to be good in order to have production." P10
	Maintenance	Preserving to maintain a certain condition or state (Manganye & Tlabela, 2008).	"People report they even fill the log book if there's something wrong in the crane but you find out that nothing is done about it." P12 "We do report these things and sometimes they come and check but in two weeks, two months this thing will come again." P6

			"Cause we have to carry on with the operation we can't stop the crane while the technical team says no the crane is perfect." P3 "They are the ones who are responsible for the cranes all we do is just stand there and look at the crane so if they can do their inspection properly and make sure that they give us proper cranes to work with, which are reliable then the incidents will be less." P3 "Like their maintenance, service on the crane that's all on their side." P3 "They saying we waiting for parts, we waiting for someone to do this, we waiting for someone to that." P11 "Some of things that causes accidents is things that have been reported but have not been attended to." P11
	Equipment	Physical resources or tools used to equip an individual to perform a task in the workplace (Health & Safety Authority, 2019).	"I think there must be crane drivers who are there when they decide to buy cranes because sometimes they just buy cranes without enquiring from the crane divers, people who operate the crane." P12 "Yah the breakdowns are a big challenge when there's no breakdowns nothing is challenging about the crane everything is smooth." P6 "Sometimes a crane just fail, because maybe the machine broke." P12 "The crane spreader was faulty it dropped twin lift boxes which is 220 containers inside the vessel causing 8 boxes damage due to a simple malfunction." P15 "There are some incidents that cannot be avoided for example, if the vessel is listing, you may cause an accident when you working with the vessel sitting like that." P11
	Aged Equipment		"No the slots from the vessel are too old, this is the other challenge that we receive from the shipping line people." P6 "You can't be pushing equipment that's meant to last certain years and extend it double the life span." P14

4.3 Theme 1: Job Factors

Theme 1: Job Factors, addresses research questions (I) and (IV) of the study: "What job factors do Crane Operators' and Crane Supervisors' attribute to crane incidents? The Crane Operators and Crane Supervisors attributed 1) communication, 2) maintenance, 3) equipment and 4) aged equipment as the job factors that they attribute to crane incidents. This is demonstrated in Tables 7 and 8 above where the sub-themes are listed along with quotes from the data collected. Job factors can be described as the aspects that are specific to a certain job, for example, the physical and mental demands, skills and knowledge associated with the execution of a job. Evidence for the themes and sub-themes was provided in the form of examples/quotes that emerged from the interviews. It should be noted that some of the examples/quotes were edited for confidentiality and clarity purposes. This was done by removing identifiers such as employee names or the organisation's name.

4.3.1 Communication

Communication is a job factor that can be described as a two-way process in which two or more parties engage through various channels such as speech, writing or expression to share information, feelings, news or ideas to a point where a mutual understanding is reached (Spaho, 2012). In this way, communication is used to connect people and to enable them to share meanings (Spaho, 2012). Communication is a situational (external) factor that affects the manner in which the Crane Operators and Crane Supervisors carry out their job tasks. The data revealed that both Crane Operators and Crane Supervisors found communication to be a significant influence on crane incidents. Although both Crane Operators and Crane Supervisors mentioned communication as being a problem, the Crane Supervisors emphasised that the Crane Operators had a role to play in the communication problem as demonstrated in the following quotes from Crane Supervisors:

> *"They need to listen to the radio so they can be able to communicate with the hatch men and controllers… that will prevent more accidents." P6*
>
> *"Poor communication on the part of operators and the stevedoring companies" P11*
>
> *"When the driver loses concentration he is trying to change the channel, trying to speak to you, there's an accident." P14*

In contrast, Crane Operators emphasised radio communication, lack of communication from the hatch men and language as being the most concerning communication issues that contribute towards crane incidents. One of the Crane Supervisors also mentioned language barrier as being an issue, however the sub-theme was not as prevalent in the responses of the Crane

Supervisors as it was in the Crane Operators' responses. Language barrier refers to the inability of people to speak a common language which they can both understand (Whitman et al., 2006).

4.3.2 Maintenance

Maintenance is the second job factor that emerged as a theme from the data. This job factor can be described as a process whereby the state or condition of an object (equipment) is preserved (Manganye & Tlabela, 2008). Maintenance is carried out by the technical team and is outside of the Crane Operators' scope, therefore this job factor is seen as a situational (external) factor. Both Crane Operators and Crane Supervisors attributed lack of maintenance to crane incidents. Both groups revealed that although technical issues are reported on, the issues were not attended to resulting in crane incidents as demonstrated in the following quotes from Crane Operators and Crane Supervisors:

Crane Operators:

> *"The third incident came down to maintenance once again." P8*

> *"If they can do the inspection properly and make sure that they give us proper cranes to work with, reliable cranes, then the incidents will be less." P7*

Crane Supervisors:

> *"Some of the things that causes accidents is things that have been reported but have not been attended to." P11*

4.3.3 Equipment

The third job factor that emerged was that of equipment. Equipment can be defined as a set of resources or tools used for the execution of a particular activity or task (Health & Safety Authority, 2019). A distinction should be made between equipment and maintenance because the one factor is related to the up-keeping of the equipment, and the other is related to the type and condition of equipment that is provided or purchased by the organisation. Both Crane Operators and Crane Supervisors attributed crane incidents to equipment issues and the type of cranes purchased as demonstrated in the below quotes from the two groups.

Crane Operators:

"They should have contacted the people that actually work on the cranes and they should have asked them what do they want here, and what do you feel is the best here, not just do shady deals and get machines."

"Some of the vessel, they come damaged, badly damaged." P2

"We've got some challenges of the big vessel some of those challenges ehh because of the height of the boxes." P2

"Uhm… with regards to over heights obviously that's very risky." P8

Crane Supervisors:

"I think there must be crane drivers who are there when they decide to buy cranes because sometimes they just buy cranes without enquiring from the crane drivers, people who operate the crane." P12

4.3.4 Aged equipment

Both the Crane Operators and Crane Supervisors had similar attributions and expressed that the age of the cranes contributed towards incidents as demonstrated in the below quotes:

Crane Operators:

"Our big contributing factor is that we have a lot of delays because of the break-downs due to the age of the equipment." P1

"Yes, I have twice before with the older cranes, the much older cranes." P4

"Like I said, you get ships that are very old so some of the twist locks are old and they jam so yah." P4

Crane Supervisors:

"The slots from the vessel are too old, this is the other challenge that we receive from the shipping line people." P6

"You can't be pushing equipment that's meant to last certain years and extend it double the life span." P14

4.3.5 Application of attribution theory to Job Factors

The results show that there are some similarities as well as differences in the attributions of Crane Operators and Crane Supervisors with regards to the job factors that were found to contribute towards crane incidents. The difference between the two groups was observed within the sub-theme of communication where a number of supervisors viewed the communication issue as a result of the Crane Operators' lack of concentration and lack of communication with the hatch men. The findings within the communication sub-theme demonstrate the Crane Supervisors' inclination for attributing crane incidents to internal factors. On the other hand, similarities were also found in the attributions of Crane Operators and Crane Supervisors under the themes of equipment, aged equipment and maintenance. These similarities will be discussed following the discussion on the differences between the two groups.

a. Differences in Crane Operator and Crane Supervisor Attributions

The difference in the Crane Operators' and Crane Supervisors' attributions on communication demonstrate the inclination of Supervisors for attributing workplace incidents to internal factors that place the responsibility on the sub-ordinate. At first, the Crane Supervisors acknowledged that communication issues at the port played a considerable role in crane incidents and; as previously discussed, communication is not entirely within the control of Crane Operators and is seen as an external attribution. Therefore, based on this acknowledgement, it may have seemed that they made an external attribution, however, after acknowledging the effects they then emphasised the fact that Crane Operators still played a role in causing the incident by not concentrating and communicating effectively with the hatch men. Therefore, the Crane Supervisors attributed communication problems and crane incidents internally to the Crane Operators. This finding is similar to previous research by Dejoy (1987) who found that supervisors are prone to making internal attributions that place the blame on the subordinate. Further studies by Gyekye (2010), Salminen (1992), Hamilton (1986) and Mitchell and Wood (1980) also correspond with these findings.

Job Factors and Causal Schema

To further understand the reasons for the differences in Crane Supervisor and Crane Operator attributions under this sub-theme, the works of attribution theorists are applied. According to Jones and Davis (1965), the observer considers the intention of the actor when making an attribution. The observer considers the knowledge and ability of the actor in relation to their action to determine whether the actions were intentional, and if found to be intentional, an

internal attribution is made. In the current study, Crane Supervisors made internal attributions to Crane Operators with regards to communication. The internal attribution made to the Crane Operators on communication may have been influenced by the fact that the supervisors believe that the Crane Operators have knowledge on how to operate the radio and that they also have the ability to make use of the radio, therefore the Crane Operators were capable of ensuring successful communication, however didn't communicate effectively with the stevedores. This belief or causal schema on the Crane Operators' radio abilities may have caused the Crane Supervisors to discount other factors that may be causing communication problems such as language and the stevedores' lack of concentration.

Further, there is consensus from both Crane Operators and Crane Supervisors that there are a lot of people on the radio and this is also worsened by the fact that the radio is used for social conversations by the Crane Operators. This belief that the radio is not used as it should, could be so entrenched in the Crane Supervisors' minds that they often do not explore other possible factors that could be contributing to the communication issues and crane incidents. This inclination to resort to causal schema when evaluating incidents is affected by the context in which the attribution is made. When an observer is faced with the task of making a quick attribution as found in the work environment of Port X, it is often easier and faster to refer to causal schema instead of taking the time to critically assess the incident (Gronhaug & Falkenberg, 1994). There is a lot of pressure to meet tight deadlines and reach targets therefore Port X is fast paced and Crane Supervisors do not have sufficient time to spend on incident investigations. This type of attribution process often takes place with minor incidents because the Crane Supervisors are not motivated to find the true cause of the incident.

Job Factors and Safety Culture

Another point that should be noted is that of the safety culture of Port X. The safety culture was described as bad and non-existent by both Crane Operators and Crane Supervisors. With this type of culture, crane incidents might not be taken seriously outside of an investigation, thus contributing to the Crane Supervisors' lack of attention to making accurate causal attributions. In contrast, more information is gathered when processing attributions for more serious incidents because the outcome of the attribution would result in serious consequences such as disciplinary hearings and sometimes termination of employment.

Job Factors and Cultural Background

An additional consideration is that of the cultural make-up of the Crane Supervisors. The majority of Crane Supervisors, specifically 6 out of the 8 Crane Supervisors were black and Zulu speaking, therefore, language barrier was not a challenge for them. This may have made them blind to the Crane Operators' challenges because they had different experiences when it came to language. This lack of information and exposure may have caused the Zulu speaking Crane Supervisors to cognitively process the attributions differently to Crane Operators who didn't speak Zulu and thus resulting in different attributions. Further, as observers, Crane Supervisors have limited information about the actions of Crane Operators and their communication with stevedores. This limited information has resulted in misperceptions on the part of the Crane Supervisors, resulting in the difference in perception between the two parties.

Job Factors and Punitive/ Blame Culture

The Crane Operators' external attributions and lack of personal responsibility with regards to communication is also in line with Gyekye (2010) and Shaver (1970) who found that subordinate workers tend to make external attributions to incidents especially in organisations that have punitive cultures. This is even more so in cases where the crane incident was serious because they will be motivated to avoid being blamed and disciplined for the incident (Gyekye, 2010; Shaver, 1970). The findings showed that there is a blame culture at Port X, therefore the Crane Operators often make defensive attributions in order to avoid the blame and discipline that follows after an incident. This can be observed in the below quotes:

> *"Its also to cover yourself because you could be blamed for something that someone else damaged." P1*

> *"They will have to blame somebody if someone died or is injured." P9*

Job Factors and Self-Esteem of Crane Operators

When considering the attributions of Crane Operators, it should be noted that the theme of Job Factors is closely tied to their job performance. An employee's performance can have a great impact on their self-esteem with bad performance negatively affecting self-esteem and good performance leading to higher self-esteem (Gronhaug & Falkenberg, 1994). Based on this principle, Crane Operators are motivated to protect their self-esteem by attributing their bad performance to external factors. In this way, it is self-serving for the Crane Operators to

perceive that the communication and job factors that contribute towards crane incidents are external to themselves.

Applying Orvis, Cunningham and Kelley's (1975) Information Patterns to Attributions

Orvis, Cunningham and Kelley's Information (1975) Patterns, can also help us understand how Crane Operators attributed communication problems to the stevedores. Stevedores are seen as less experienced workers because they are contractors from outside the organisation and do not have an understanding of the organisation's policies and processes. There is a high consensus amongst the Crane Operators and Crane Supervisors on this matter and the stevedores have demonstrated their lack of experience several times (high consistency). It is also not out of the norm for a stevedore to communicate using the wrong language (low distinctiveness). By evaluating these three principles of consensus, distinctiveness and consistency, we can see how the Crane Operators placed the responsibility of the communication issues and incidents to the stevedores. See Table 10 below:

Table 9: Kelley's date Information Patterns

	Information Pattern		
Attribution	**Consensus**	**Distinctiveness**	**Consistency**
Person (Internal)	*high*	*Low*	*High*
Situation (External)	*Low*	*High*	*Low*

b. Similarities in Crane Operator and Crane Supervisor Attributions

The results within the theme of Job Factors also demonstrate that Crane Operators and Crane Supervisors made similar attributions to crane incidents with regards to the equipment, aged equipment and maintenance job factors. This is in contradiction to the research hypothesis which states that Crane Operators' and Crane Supervisors' perceptions on incident causation would differ based on factors such as hierarchical level.

Worker Experience

Work experience refers to any skills an individual gains while performing duties in a particular occupation or field (Brown, 2014). The similarities in attributions between the Crane Operators and Crane Supervisors could be due to a number of reasons such as the cultural backgrounds

of the two groups, the level of proximity in which they work with each other, their work experiences and the team culture (Gyekye, 2010; Gyekye & Salminen, 2007; Gyekye, 2001). Individuals from collectivistic cultural groups such as those found in the group of Crane Supervisors at Port X, have an interdependent self-construal and tend to place a lot of importance on having good interpersonal relationships, in-group harmony, and conformity to social norms (Kwan, Bond, & Singelis, 1997). Therefore the Crane Supervisors may tend to make external attributions in order to maintain in-group harmony and to conform to the social norms at the Port.

Crane Supervisors came across as supportive towards Crane Operators when it came to job factors of equipment, aged equipment and maintenance. According to attribution theory, this could be a result of the two groups having similar personal characteristics and work experiences (Gyekye, 2010). Both groups work in close proximity to each other as part of one team and both interact with stevedores and straddle drivers and experience challenges with the equipment and maintenance. The Crane Supervisors' and Crane Operators' shared personal characteristics and work experiences may have caused the Crane Supervisors to take a protective stance by attributing crane incidents to external factors. The common characteristics and experiences allows them to relate to each other on a professional and personal level causing the Crane Supervisors to consider their own vulnerabilities and the possibility of facing blame over equipment issues in the future.

When it comes to issues of equipment and maintenance, there are other parties that are involved such as the maintenance/technical team and the procurement team acting on behalf of the organisation. These teams are separate to the Crane Operators and Crane Supervisors as they are not directly involved in the crane operations. This separation of work areas and objectives makes the technical team and management team situationally irrelevant to the Crane Operators and Supervisors. In this instance, it is likely that internal attributions that place the blame on the technical team and management would be made by both the Crane Operators and Supervisors with regards to the equipment and maintenance.

Job Factors and Self-Esteem of the Crane Supervisors

Working as part of one team means that there are shared responsibilities for performance across the team. Supervisors are responsible for the monitoring of crane operations including the performance of Crane Operators. To attribute crane incidents to Crane Operators would be to attribute crane incidents to themselves because the Supervisor is ultimately the accountable

party when it comes to performance. When Crane Operators are not performing, it reflects badly on their supervision skills therefore Crane Supervisors may be motivated to maintain their self-esteems by protecting Crane Operators and attributing crane incidents to external factors.

By applying attribution theory to the findings within the theme of job factors, the researcher was able to explore and understand the reasons for the differences and similarities in the Crane Operators' and Crane Supervisors' attributions. The same process of applying attribution theory to the findings was continued under theme 2 which will be discussed in the section to follow.

Table 10: Theme 2 (Organisational Factors) - Crane Operator Responses

"Organisational Factors	Safety Culture	The manner in which safety is managed in the workplace (Choudhry et al., 2007; Wiegmann et al., 2007).	"I can't lie, some of them they know it but they cross it." P2 "Maybe as you report continuously they will take you seriously." P2 "The company advertises a lot of safety but personally I don't think there's a lot of safety happening in this place." P4 "They practice safety only when it suits them." P4 "Safety is non-existent in this place yah and that also coming back to stevedores." P5 "They say whatever you learnt in school forget about it this is how we do this here and then you fall into that culture." P5 "I don't think they worry about safety too much because they are not involved, they sit in their offices, they are not the ones who are going to pass out and make incidents." P8 "If I was going to get charged then obviously I would wear it but by not wearing it I would be ok." P8 "They bend the rules." P9 "Sometimes there's a gas leak you know it affects anybody you tell them hey can you smell that gas? Then they tell you no there's no gas go and work but you can smell it." P9 "Yah I mean if you as a Crane Operator at any time you feel it's unsafe to carry on you can stop the job" P7 "Uhm they are very safety oriented" P7
	Blame and Punitive Culture	A work environment in which employees are punished for mistakes. / A work environment in which an	"It's also to cover yourself because you could be blamed for something that someone else damaged." P1 "Yah, they are charging us hey, they are serious." P2 "They will have to find the culprit. The cause." P2

		emphasis is placed on finding a culprit or someone to blame (Clarke, 2011).	"A lot of times the company will tell you to carry on and it's your fault when something happens." P7 "In most cases you can't report your incident over the radio because they will tease you about it and you will never live it out." P8 "They will have to blame somebody if someone died or is injured." P9 "Depending on how bad it is you have enquiries after that where they will then determine whether it's the operator's fault or whether is a mechanical fault." P16
	Transparency	Transparency exists in an organisation where all legally releasable information is availed efficiently to ensure clarity, openness and accountability (Rawlins, 2008).	"The thing is we don't know, we don't get any reports of other people or sections." P1 "You just hear by the way, and people talking, we don't know if half of it is true." P1 "No one tells you anything, half the time you don't even hear anything, you just here to work and get your money. It's sad but that's how it is." P4 "We don't really know what happens or whether if something happens there the guys might know then it goes quiet." P5 "No one says anything, nothing is really shared everything is like top secret in this place." P5 "There is a lot of friendships here where people try to cover up for their friends by not reporting incidents and stuff like that." P8 "I don't know. We get kept in the darkness a lot." P8
	Training	The process of teaching employees a certain skill or behaviour (Elnaga & Imran, 2013).	"I passed actually not really knowing much about the crane to be honest." P5 "A lot of people get their crane license and put on mentorship when they should be nowhere near the crane." P8 "Yes I had to teach myself to drive a crane how to do everything all the tricks of the crane because I never had a mentor because there's was no one to fill his gap". P8 "Here I don't think they give any training they just go there for a holiday." P9 "He doesn't know what to do because he was not taught that in the training that's how they damage the boxes." P9

			"It's not enough, they don't give you time on the crane, any operator can only get better if he spends time on the crane." P16
	Work Relationships	The interactions between co-workers within a working environment (Mastroianni & Storberg-Walker, 2014).	"Ugh I think any manager up from the supervisor you can trust them you can rely on them." P4 "I think there is a lot of mutual trust, most of these guys have been working together for years, so ya." P5 "They would be on your side even if it's your fault they will give you the benefit of the doubt because basically we are all here as a family trying to look after our families." P7 "Yes, supervisors are there for us." P7 "There is a lot of friendships here where people try to cover up for their friends by not reporting incidents and stuff like that." P8 "As a crane driver, I'm close to quite a few of them." P8

Table 11: Theme 2 (Organisational Factors) - Crane Supervisor Responses

"Organisational Factors	Safety Culture	The manner in which safety is managed in the workplace (Choudhry et al., 2007; Wiegmann et al., 2007).	"People are like, ahh… Even if we report, nothing is going to happen so why should I bother, they've adopted that kind of attitude towards reporting." P11 "If the crane is not operating the way you want it, they (management) say you must carry on as safe as you can as long as the job is going." P12 "Sometimes we do short cuts to do what they (management) really want, which they don't know but we take risk here to make our target at the end of the day." P12 "We report things that can cause an incident and nothing happens, they wait until the accident happens then fix it." P12 "Zero! They don't care about safety, especially the line managers because as I told you they do force us to work even if the wind is above 70 km/h." P13 "Non-existent. I know for a fact other ports they hammer on safety but here it's not really existing." P14 "I can say maybe it's just, I don't know ignorance maybe like someone on a 2 hour break will think ok in that 2hours I don't need to wear a vest I can put on my flip-flops." P13 "Sometimes you will work against you own word when it comes to safety." P6 "Ya, they understand in terms of the safety." P6 "They might talk about safety but every time they need their 32 or more boxes so in that people end up working faster and the accidents might happen." P10 "No I don't think they are following them but they know." P10 "Like I said earlier there are things that have been reported but have not attended too, so people are starting to lose interest in reporting any safety hazards." P11 "Yah 4 cranes on one ship that's where you get those accidents." P12 "No it becomes a problem if maybe there is an accident maybe there comes a safety officer." P13

			"I think they just take them for granted especially the minor one especially if no one saw that accident happen." P13 "Like one accident the spreader knocked the crane there because it was slippery so if maybe they could take those things we report seriously we could have avoided that accident." P13 "There's no like a safety thing before you climb there's no discussion between Stevedoring and Port X." P14 "They will tell the supervisor and the crane driver to carry on, but as a previous crane driver you know when things are unsafe." P14 "It's good they've got all the policies and procedures in place which needs to be adhere to and followed." P15
	Blame and Punitive Culture	A work environment in which employees are punished for mistakes. / A work environment in which an emphasis is placed on finding a culprit or someone to blame (Clarke, 2011).	"It's a pointing fingers culture, finding someone that I can blame which they can see that there is something wrong but they can shift the blame to someone." P12 "They shift the blame from technical to the Crane Operator." P12 "We don't have enough power as I said they shift the blame to the employees now we find ourselves protecting the employee instead of fixing the problem and deal with the person that was supposed to fix the problem that was mentioned." P12 "I'd say the technical because they are protecting themselves as well, they protect themselves so that they don't get the blame." P12 "Sometimes they keep quiet about things like if you damage something you keep quiet. They don't want to be charged." P13 "Yah first of all it was his fault because when the crane is right he was supposed to come back to the channel and communicate with the controller." P3 "Yes they get charged." P10

			"Our safety people are doing the blame thing because everyone when they did something they get what they are supposed to get in terms of disciplinary, so someone is gonna go there and get disciplined." P10 "You are obviously called to see what had happened identify what caused the accident and obviously discipline the person that caused the accident." P11 "As a supervisor I will have to discipline the person that caused the accident so it actually causes a clash whereby you know that from experience that there are some things that cannot be avoided and obviously as a supervisor you have to." P11 "But when something happens something major happens they will blame the crane driver that it is the crane driver's fault." P12 "Cause what we do they will blame you there in the board room, the SHEQ people from safety, people from cranes and technical, they will blame you there." P12 "Blaming comes in, we work too much." P14 "They use the policy against us." P14
	Training	The process of teaching employees a certain skill or behaviour (Elnaga & Imran, 2013).	"The training is very important and refreshment in the old crane drivers." P6 "When we get new equipment, we take people to school for training." P6 "We cannot shift everything to the training because at the training what they actually teach you to do is put on your crane trolley forward trolley back long travel." P11 "It's enough yes." P12 "I don't know, blank." P14 "Due to the training that is cut short they fail to pick up all the techniques." P15

4.4 Theme 2: Organisational Factors

Organisational factors refer to the manner in which the organisation functions, its processes, policies and culture. Organisational factors can be external, for example industry regulations and legislation; or they could be internal such as company policies. In the current study, the focus will be on internal organisational factors due to the limited scope of the study and the exposure of the research participants to external organisational factors such as regulations. The thematic analysis revealed five sub-themes under organisational factors. Three of the five sub-themes, safety culture, punitive/blame culture and training emerged from both groups and two sub-themes, transparency and work relationships only emerged from the Crane Operators' interviews.

4.4.1 Safety Culture

Safety culture refers to the norms and values of the organisation in relation to health and safety within the organisation (Choudhry et al., 2007; Wiegmann et al., 2007). The norms and values of the organisation with regards to health and safety are dictated by the organisation and therefore, safety culture is viewed as an external (situational) factor, however, safety culture is also expressed through the behaviours of the individuals within the organisation, therefore safety culture may also be viewed as an internal (dispositional) factor. The results of the thematic analysis demonstrate that both Crane Operators and Crane Supervisors attribute crane incidents to the safety culture of the organisation, although there were slight differences in the two groups' perceptions on who played a role towards the safety issues. Crane Operators perceived Crane Supervisors as the main reason why the safety culture at the port was not good and Crane Supervisors' perceived managers and the technical team as playing a role in the safety issues and in creating an environment that made it difficult for them to supervise crane operations in a safe manner. The Crane Operators mentioned that supervisors made it difficult for them to adhere to safety policies because supervisors would often "bend the rules" and only applied safety rules when it suited them. A few of the Crane Operators also expressed that they were even told to forget some of the safety rules they were taught at the Marine Academy because "things" were done differently during operations. They also expressed that their complaints were not taken seriously when they complained about safety issues regarding equipment, gas leaks and fumes. Evidence of these were found in the quotes below from the Crane Operators. The Crane Supervisors expressed how targets were often prioritised over safety and how the maintenance of equipment was not taken seriously, resulting in crane incidents as demonstrated in the below quotes:

Crane Operators:

"I cant lie, some of them they know it (safety policy) but they cross it." P2

"They practice safety only when it suits them (Crane Supervisors)." P4

"They bend the rules (Crane Supervisors)." P9

"They say whatever you learnt in school, forget about it, this is how we do this here, and then you fall into that culture (Crane Supervisors)." P5

"Sometimes there's a gas leak. You know it affects everybody, you tell them, hey, can you smell that gas? They they tell you, no, go work but you can smell it." P9

Crane Supervisors:

"Sometimes we do short cuts to do what they (management) really want, which they don't know, but we take risk here to make our target at the end of the day." P12

"We report things that can cause an incident and nothing happens, they wait until the accident happens then fix it (technical team)." P12

"Zero! They don't care about safety, especially the line managers." P13

4.4.2 Punitive/Blame Culture

This type of culture can be observed in an organisation that prefers to deal with accidents through a disciplinary process where employees can be terminated or even prosecuted (Clarke, 2011). A punitive culture is often described as a blame culture where the focus of the organisation is on finding the guilty party during incidents (Khatri, Brown & Hicks, 2009). The sub-theme of a punitive/blame culture emerged from both the Crane Operators' and Crane Supervisors' interviews as an issue that affects incident reporting in the organisation. A punitive/blame culture was not found to be directly linked to crane incidents, however it can create an environment where crane incidents are not reported or are even covered up in order to avoid blame and punishment. This is demonstrated in the below quotes from Crane Operators and Crane Supervisors:

Crane Operators:

"Its also to cover yourself because you could be blamed for something that someone else damaged." P1

"Yah, they are charging us hey, they are serious." P2

"They will have to blame somebody if someone died or is injured." P9

Crane Supervisors:

"Finding someone they can blame which they can see that there is something wrong but they can shift the blame to someone." P12

"Sometimes they keep quiet about things, like if you damage something you keep quiet. They don't want to be charged." P13

"But when something major happens, they will blame the crane driver that it is the crane driver's fault." P12

4.4.3 Transparency

Transparency exists in an organisation when there is clarity and openness with regards to decisions made, the rules as well as the exchange of information. Rules and decisions are made at the management level at Port X, therefore the Crane Operators do not have any authority to make rules and decisions, and these are merely shared with the Crane Operators through communication with Crane Supervisors. Hence, Crane Operators view transparency as an external (situational) factor which is controlled by the management of the organisation. The sub-theme of transparency only emerged from the Crane Operators' interviews. Crane Operators expressed that a lot of information, especially regarding crane incidents is not openly discussed with Crane Operators as demonstrated in the following quotes:

"The thing is we don't know, we don't get any reports of ther people or sections." P1

"No one tells you anything. Half the time you don't hear anything, you are just here to work and get your money. Its sad but that's how it is." P4

"We don't really know what happens, if something happens it goes quiet." P5

4.4.4 Training

Training can be defined as an exercise that is aimed at providing information or instructions to a participant in order to equip them with knowledge and skills required to improve performance in the workplace (Elnaga & Imran, 2013). The organisation is responsible for providing training and refresher training to Crane Operators at the port, therefore training is viewed as an external (situational) factor. The sub-theme of training emerged from both Crane Operators and Crane Supervisors however, there were differences in the perceptions of Crane Operators and Crane Supervisors with regards to the attribution of training to the cause of crane incidents. Crane

Operators mostly expressed that the training provided was not sufficient to equip them with the skills needed to perform crane operations effectively, and therefore has resulted in inexperienced operators being involved in crane incidents. In contrast, most Crane Supervisors felt that enough training was provided to Crane Operators. There was however, one Crane Supervisor who felt that the training was not sufficient for Crane Operators. These findings were demonstrated in the below quotes from Crane Operators and Crane Supervisors:

Crane Operators:

> *"I passed actually not really knowing much about the crane to be honest." P5*
>
> *"A lot of people get their license and put on mentorship when they should be nowhere near the crane." P8*
>
> *"He doesn't know what to do because he was not taught that in the training, that's how they damage the boxes." P9*

Crane Supervisors:

> *"When we get new equipment, we take people for training." P6*
>
> *"We cannot shift everything to training because at training, what they actually teach you to do is out on your crane and trolley forward and back." P8*
>
> *"Its enough, yes." P12*

4.4.5 Work Relationships

A work relationship can be described as a close relationship between colleagues that enables them to work well together (Mastroianni & Storberg-Walker, 2014). Work relationships exist between two or more people and therefore, can never really be under the control of only one individual. And since work relationships are not always under one's control, they are viewed as external (situational) factors. The sub-theme of work relationships only emerged from Crane Operators' interviews. Crane Operators expressed that the work relationships they have with their colleagues and supervisors have an influence on the manner in which crane incidents are reported. The Crane Operators believed that the supervisors can be trusted during crane incident investigations and that the supervisors can also protect them if need be. This was demonstrated in the below quotes from Crane Operators:

> *"I think there is a lot of mutual trust, most of these guys have been working together for years, so ya." P5*

"They would be on your side even if its your fault, they will give you the benefit of the doubt because basically we are all here as a family, trying to look after our families." P7

"There is a lot of friendships here where people try to cover up for their friends by not reporting incidents and stuff like that." P8

4.4.6 Application of Attribution theory and Systems Thinking to Organisational Factors

The results under theme two, show that Crane Operators and Crane Supervisors make similar attributions to crane incidents with regards to organisational factors, however the data obtained from the Crane Operators demonstrated two additional external (situational) factors, namely transparency and work relationships. These two factors were not found to have a direct impact on crane incidents, however they affected the manner in which crane incidents were handled by the supervisors and the organisation. These additional factors demonstrate the tendency of the operator/actor to attribute workplace incidents to external factors in comparison to the supervisors/observers. To unpack this theme, attribution theory was applied and a systems thinking approach was used to understand how the different sub-themes are interlinked in the process of crane incidents.

a. Similarities in Crane Operators' and Crane Supervisors' attributions

The results from the theme of organisational factors show that the Crane Supervisors attributed crane incidents to factors outside of the Crane Operators control, such as safety culture. This is in disagreement with previous research by Dejoy (1987), Salminen (1992) and Gykye and Salminen (2004) which showed that supervisors tend to attribute workplace incidents to sub-ordinates as a way of diminishing their own responsibility in the incident. In the below discussion, the researcher combined attribution theory with a systems thinking approach to examine how the Crane Operators and Crane Supervisors made similar attributions with regards to the effects of organisational factors on crane incidents.

Application of Systems Thinking

The research question on organisational factors triggered the study participants to consider other factors that are included in the socio-technical system of the Port. A socio-technical system can be described as "as a set of interrelated elements that functions as a unit for a specific purpose" (Furnam, 1997, p.74). The socio-technical system of the port includes different units, organisational levels, stakeholders, policies and regulations that all play a role

in the activities of the organisation. By considering other factors within the socio-technical system, the Crane Operators and Crane Supervisors expanded their perspective on potential 'responsible' parties. This expanded the 'we' and 'they' or 'actors' and 'observers' from Crane Operators and Crane Supervisors to all possible factors within the organisation. The Crane Supervisors began to consider the effects of management, the technical team, safety culture, blame culture and equipment on crane incidents, whereas they hadn't previously been considered. This expansion on perspective enabled the Crane Operators and Crane Supervisors to make more thorough and accurate attributions that went beyond tapping into the causal schema that existed and thus allowing the two groups to come up with similar attributions.

It can be noted that the application of a systems thinking approach has an impact on the attributional processes of the two groups by influencing the way in which the two groups see themselves in relation to each other. The proximity in which they observe each other changed when the two groups started to consider the different elements within the socio-technical system of the port. They saw each other as being part of one unit and thus inclined towards making external attributions for crane incidents.

In addition, this approach of considering the different factors within the organisation and across the different organisational levels also allows the observers to look beyond finding the responsible party and to start considering other possible factors. This process of considering all possible factors and gathering more information results in more accurate attributions.

Lastly, underlying factors such as safety culture and blame culture are often overlooked despite having such a significant impact on the behaviour of workers. The use of a systems approach enables investigators and researchers to fully explore the different factors involved in the cause of incidents by factoring in the activities that take place across the different levels of the organisation as well as the regulations and policies. A further explanation on the similarities found in the Crane Operators' and Crane Supervisors' attributions could be provided by examining the effects of cultural background on attributions.

Organisational Factors and Cultural Background

The Crane Supervisors from Port X were mostly from a collectivistic cultural background and the team culture was that of a 'family' as demonstrated in the following quote by a Crane Operator:

"They would be on your side even if its your fault, they will give you the benefit of the doubt because basically we are all here as a family, trying to look after our families." P7

As previously mentioned in the discussion above on job factors, these factors may have caused the Crane Supervisors to make external attributions because maintaining a harmonious relationship within the team is a source of self-esteem for the Crane Supervisors as found in individuals from collectivistic cultural backgrounds. These external attributions made by the Crane Supervisors are in contradiction to previous research by Dejoy (1987), Salminen (1992) and Gyekye and Salminen (2004). This contradiction may be due to the fact that the studies in the literature were conducted on western employees, whereas the current study was conducted in the South African context where the majority of the population is from collectivistic cultural backgrounds. Despite this contradiction to most attribution research on the topic, the results of the current study are supported by Gyekye's (2001) research which compared the causal attributions of Ghanaian workers from collectivistic cultural backgrounds and Finnish workers from individualistic cultural backgrounds. The study found that the Ghanaian workers were more likely to attribute accident responsibility to external factors than Finnish workers who were from individualistic cultures. Therefore the current study still demonstrated how cultural background can have an impact on the attributions of workers.

Organisational Factors and Worker Experience

The Crane Operators and Crane Supervisors at Port X work in close proximity to one another and see each other as a team therefore this may have caused the Crane Supervisors' to develop defensive attributions in order to protect the Crane Operators resulting in similar (external) attributions being made by the two groups.

Both groups kept referring to "they" when making causal attributions for the organisational factors. The use of "they" shows that the Crane Operators and Crane Supervisors see themselves as separate to the groups they identified as being responsible for the organisational issues. Attribution theory demonstrates that when individuals make attributions, their proximity to the observed individual as well as their relevance to the 'actor' plays a role in how they make an attribution. By describing the Crane Supervisors and technical team as 'they', the Crane Operators displayed this non-relevance and thus attributed crane incidents to the internal dispositions of the groups and thus placing the blame on "they". The Crane Supervisors also demonstrated the non-relevance by attributing crane incidents to management and the technical team.

Organisational Factors and Blame Culture

The similarities in the two groups was also observed in how they both made self-defensive attributions in order to protect their self-esteem and to avoid blame and punishment. These similar attributions were most likely influenced by the blame culture of the organisation. This further demonstrates the compounding effect of a blame culture in an organisation. The next section will discuss the differences found in the attributions of Crane Operators and Crane Supervisors within the theme of Organisational Factors.

b. Differences in Crane Operator and Crane Supervisor attributions

The results for the theme of organisational factors show that Crane Operators listed more organisational factors than Crane Supervisors as factors that contribute towards crane incidents. The Crane Operators listed safety culture, blame culture, training, transparency and work relationships while the Crane Supervisors only listed the first three organisational factors listed above. To understand the differences in the Crane Operators' and Crane Supervisors' perceptions, the researcher will repeat the process of applying attribution theory as well as systems thinking to the results that were found in the study.

Antecedents of Attribution and Transparency

One of the main reasons for a difference in the attributions of Crane Operators and Crane Supervisors is that of the antecedent factors that exist within the individuals that make up each group. In the literature review discussed in Chapter 2 of the current research study, it was highlighted that there are three antecedent factors which affect attribution, and these are 1) information, 2) beliefs, and 3) motivation (Heider, 1958; Kelley, 1967 & Weiner, 1958). By analysing the collected data from the two groups, it can be assumed that there were differences between the Crane Operators' and Crane Supervisors' with regard to the three aforementioned antecedent factors.

Firstly, the researcher examined the antecedent factor of information and the following was observed: The Crane Operators have limited access to information in comparison to the Crane Supervisors based on factors associated with hierarchical level and the level of transparency within the organisation. When considering the socio-technical system of the organisation, the issue of transparency can be furthered explored. Crane Supervisors have access to emails, reports and line management meetings which the Crane Operators do not have access to. This results in the two groups having different organisational experiences as far as communication

is concerned. And as mentioned previously, the amount of information and type of information one has access to affects their cognitive processing and thus their perceptions. Therefore, the difference in the external attributions of the Crane Operators and Crane Supervisors can be attributed to the difference in information held by the two groups. This limited information has also caused the Crane Operators to develop beliefs that the organisation is not transparent about organisational matters. As a follow up to the examination of information, the beliefs of the two groups were explored. Over time, Crane Operators developed the belief that the organisation withholds information because of the limited information which Crane Operators receive. This belief has affected the Crane Operators' attitudes towards the organisation and has also affected their future expectations with regards to transparency in the organisation. Therefore, it can be said that the Crane Operators' beliefs influenced them to recognise transparency as an issue whereas Crane Supervisors didn't. The last factor which was explored was that of motivations. As much as the Crane Operators and Crane Supervisors are part of one team and often have similar motivations, it can also be said that their motivations differ, depending on the circumstances. The Crane Operators are motivated to make attributions that take the blame away from them in order to avoid punishment. The Crane Supervisors do not necessarily have the same motivation because they do not get directly punished for crane incidents taking place. It is often the Crane Operator who gets taken to a disciplinary hearing to determine whether or not they were responsible for the incident. In addition, Crane Operators are motivated to make attributions that will protect and maintain their self-esteem, because as mentioned previously, their work performance has an impact on how they value themselves.

The application of antecedent factors in analysing Crane Operator and Crane Supervisor attributions enabled the researcher to understand how the two groups perceived organisational factors differently. Another factor which was discovered in the results from the Crane Operators' data was that of work relationships. This difference in attributions is explored in the below section with reference to the cultural backgrounds of the two groups.

Cultural Background and Work Relationships

The results of the study showed that the Crane Operators believed that their work relationships with their Supervisors affected the way in which their Supervisors analysed crane incidents in the workplace. The sub-theme of work relationships didn't emerge from the Crane Supervisor data, therefore the researcher explored this difference in perceptions by applying attribution research, specifically, the effects of cultural background on attributions. As previously

established, the Crane Operators group is mostly made up of individuals from individualistic cultures with an independent self-construal and the Crane Supervisors are from collectivistic cultures with an inter-dependent construal. Individuals from collectivistic cultures tend to place importance on the feeling of belonging and maintaining in-group harmony. The Crane Supervisors' efforts to create in-group harmony and to ensure that they feel like they are part of the group or team may have been interpreted as efforts to build close work relationships with the Crane Operators. The Crane Supervisors may not share the same sentiments as they are just behaving in accordance with their cultural norms and values. This may explain why the sub-theme of work relationships didn't emerge from the Crane Supervisor data. The schemas which exist in different cultures affects people's behaviours as well as their interpretations of others' behaviours. This finding further demonstrates the potential risks associated with solely basing incident investigations on people's accounts of the incident.

The researcher was able to gain a better understanding of the differences that emerge between the Crane Operators and Crane Supervisors by applying attribution theory and systems thinking approach. These next section will discuss theme 3, Environmental Factors.

Table 12: Theme 3 (Environmental Factors) – Summary of Crane Operators' Responses

Environmental Factors	Wind	The perceptible, natural movement of air.	"Wind is wind it's fine we understand them but you have to look at individual cases." P1 "If I'm picking up a container that weighs 30 or 40 tons at wind speeds of 65 or 70km per hour its fine but when I'm picking up an empty box at 50 km/h winds then it's a problem." P1 "They don't care about wind gust, they just care about limit 70. If its 70 it's ok to stop." P7 "The only thing that affects the crane is wind and maintenance." P7 "We do work in the wind a lot and obviously if you loading empty containers like the sail it will catch the wind and it shifts and the railings." P8 "Yah wind is a big impact." P8 "Yes windy days when the person is supposed to drive his damaging the rails and hatch covers." P9 "We loading empty boxes, it's giving a hard time the boxes are swinging side to side and because the wind speed is not 70kms you are not allowed to stop." P9
	Fumes	Harmful gas or smoke	"Those fumes hey, they are dangerous. Once you inhale you get dizzy, you get exhausted you can't even focus." P2 "Cabins don't always seal properly the windows and stuff so with that the fumes gets in." P5 "It actually burns your throat. You get evacuated to clinics and then in the clinic they give you a tea spoon of cough syrup and asprin and send you back to work." P8 "She passed out while driving a machine she almost made an accident she almost crashed into the block because of the gas." P8 "A lot of the time we are pushed to work under the fumes, it happens that they say carry on, carry on." P16

Table 13: Theme 3 (Environmental Factors): Crane Supervisors' Responses

Environmental Factors	Wind	The perceptible, natural movement of air.	"Obviously when its 65 its blowing hard and you can cause an accident so how do you prevent that from happening? P11 "The wind situation is very frustrating for crane drivers even for us because when they (Crane Operators) say they have to stop, its unsafe, we get harsh words from them." P12 "The difficult thing to do is to tell the driver to go work and maybe if there is maybe too much wind, so like you get pressure from the management, cause if the management says its ok for the crane driver to operate and on the other hand he reported that it's not safe yah that's the problem." P13 "I'm saying people go against that whether you tell them it's safe to work to work or not, they will tell you no its at 80 km p/h. (P6) "It was the wind but he can't stop because his wind speed hadn't passed 70 km/h, unfortunately there was gusting wind and it just happened." P6 "I mean it's the operators judgment if you see that it is not safe up there please climb down no one will force you to sit on the crane when you telling us there's a strong wind." P3 "I mean he can't be sitting up there when he can feel that the crane is shaking so we tell him that If you feel that it's not safe there the wind is too strong please climb down." P3 "Yah I remember this one day there was rain and a very strong wind and then the crane driver ended hitting the straddle." P10 "When it's windy then they tell you like we not going to work cause it's windy and those stuff and then you have to go and show them that this wind is still preferable it's not above the limit." P10 "You know that the wind is not above the level yet but he/ she is crying that the wind is too much you know." P10

			"I think most at night and it happens during the day maybe if the weather is not right especially if there's wind." P13 "Wind is a major factor in incidents because the box will swing, rain as well, if the visibility is poor you sure going to make an incident." P14 "Yah it's mainly on weather, weather permitting cause there's enough lighting for night shift." P14
	Fumes	Harmful gas or smoke	"One of the crane drivers, he drove in front of the fumes he closed his window but he was still affected. This thing happened on Monday and on Thursday he went to the hospital and they say he's been affected by strong fumes." P6 "So the fumes are a silent killer they can kill and obviously you cannot see them but you can smell them. And even though they don't affect you now but in the long run it may affect your health." P11

4.5 Theme 3: Physical Environmental Factors

Physical environmental factors refer to the part of the human environment that involves purely physical factors such as the climate, water and soil. The physical environmental factors that affect port operations include the weather, fumes from vessels and nearby plants. The sub-themes that emerged under the theme of physical environmental factors were wind and fumes. Both sub-themes emerged from the data collected from the two groups of Crane Operators and Crane Supervisors.

4.5.1 Wind

Physical environmental factors such as wind are dependent on the weather and cannot be controlled by human intervention, therefore wind is viewed as an external (situational) factor. Both Crane Operators and Crane Supervisors expressed that wind has a significant impact on crane incidents, with wind gusts and empty containers with little weight making it difficult to manage, and unsafe, for crane operations on windy days. There was however, a difference in the Crane Supervisors' perceptions on the effects of wind on crane incidents where a few indicated that although wind is a problem, Crane Operators still have control of the safety of the crane. The following findings were demonstrated in quotes from both the Crane Operators and Crane Supervisor below:

Crane Operators:

> *"If Im picking up a container that weighs 30 or 40 tons at wind speeds of 65 or 70km/h its fine, but when Im picking up an empty box at 50km/h winds, then it's a problem." P1*

> *"They don't care about wind gusts, they just care about the 70km/h limit. If its 70 km/h, its ok to stop." P7*

> *"The only thing that affects the crane is wind and maintenance." P7*

> *"Yah, wind has a big impact." P8*

Crane Supervisors:

> *"I mean, it's the operators' judgement if you see that it is not safe up there, please climb down." P3*

"When its windy they tell you, we not going to work cause its windy and then you have to go and show them that this wind is still preferable, its not above the limit." P10

"Obviously when its 65 km/h its blowing hard and you can cause an accident, so how do you prevent that from happening?" P11

"It was the wind but he cant stop because his wind speed hadnt passed 70 km/h, unfortunately there was gusting wind and it just happened." P6

"Wind is a major factor in incidents because the box will swing, rain as well, if the visibility is poor, you sure going to make an incident." P14

4.5.2 Fumes

Fumes refer to harmful gases or smoke that is often-strong smelling. Vessels and other machinery at the port often discharge strong fumes into the air where crane operations take place. Crane Operators have no control over the fumes or the evacuation process at the port, therefore this factor is viewed as an external (situational) factor. The data from the thematic analysis demonstrates that both the Crane Operators and Crane Supervisors acknowledge that fumes affect the health of Crane Operators and can lead to crane incidents. In addition, both the Crane Operators and Crane Supervisors expressed that the cabins didn't provide enough protection from fumes. This was demonstrated in the following quotes from the Crane Operators and supervisors:

Crane Operators:

"Those fumes hey, they are dangerous. Once you inhale, you get dizzy, you get exhausted, you cant even focus." P2

"Cabins don't always seal properly, the windows and stuff so the fumes get it." P5

"It actually burns your throat. You get evacuated to clinics and then in the clinic thye give you a teaspoon of cough syrup and asprin and send you back to work." P8

Crane Supervisors:

"One of the crane drivers, he drove in front of the fumes, he closed his window but he was still affected." P6

"So the fumes are a silent killer, they can kill and obviously you cannot see them but you can smell them." P11

4.5.3 Application of Attribution theory and Systems Thinking to Environmental Factors

The results that emerged under theme 3 show that Crane Operators and Crane Supervisors both perceive environmental factors such as wind and fumes as factors that contribute towards crane incidents and health problems. Both groups attributed crane incidents to external factors in this regard, however there were slight differences that were observed between the two groups which demonstrated Crane Supervisors' inclination to placing the blame on Crane Operators.

a. Similarities in Crane Operators' and Crane Supervisors' attributions

Crane Operators and Crane Supervisors both work at the dock and experience the same environmental conditions such as wind and fumes. Their similar work experiences allow the Crane Supervisors to relate to the Crane Operators and to consider their own vulnerabilities when making attributions. Both groups have experienced the effects of wind on crane operations and have entrenched mental schemas on the effects of wind. Their experience has taught them that strong winds make it challenging to carry out crane operations in a safe manner and whenever they evaluate a crane incident that involved strong wind conditions, their point of reference will be that mental schema on wind.

Crane Supervisors who have previously worked as Crane Operators have also experienced the effects of wind and fumes on crane operations and often refer back to their past experiences when making attributions on wind. This process of referring to mental schema results in other probable causes being discounted for their role in the incident because once the perceiver finds a cause for the issue, they no longer see the need to explore further causes.

b. Differences in Crane Operators' and Crane Supervisors' attributions

Although both Crane Operators and Crane Supervisors mentioned wind and fumes as contributing towards crane incidents, the Supervisors also added that the Operators had a role to play in the crane incidents involving wind. A similar finding was found within the job factors theme where both Crane Operators and Crane Supervisors perceived communication as a factor that causes incidents, however the Crane Supervisors felt that the Crane Operators were also responsible for the crane incidents. This finding shows the supervisors' tendency to place the blame on the subordinate during incidents. To explore this finding, the researcher explored the effects of safety culture on the two groups' attributions.

Safety Culture and Environmental Factors

The safety culture of the Port was shown to come second after performance objectives. Crane Supervisors were found to put pressure on Crane Operators to continue with work even when the Crane Operators felt uncomfortable to continue in strong winds. By making defensive attributions and placing the blame on Crane Operators, the Crane Supervisors ensure that they are not held responsible for not applying the wind policy correctly. In this way, the Crane Supervisors may be motivated to ensure that they are not found responsible for not making safety a priority.

Table 14: Theme 4 (Personal Factors) - Summary of Crane Operators' Responses

Personal factors	Fatigue/Concentration	Extreme tiredness or exhaustion as a result of physical or mental exertion. / Focusing of energy or attention on a particular activity or object (Lerman, 2012).	"I'll tell you personally that on the night shift and the early hours of the morning that's when you are a bit tired but I can't tell you if accidents happen then." P1 "If there is a problem in the block and the boxes are coming in slow that makes us tired." P4 "We've never really had an incident of a crane driver because his tired or anything like that you know." P4 "It's night, your brain wants to shut down. But there's no example of tiredness or fatigue that really causes anything, well not that I know of." P5 "Maybe if I wasn't tired, I would have seen it before hand." P7 "Everybody is accustom to sleeping at night that's where your body is… so you get drowsy and make misjudgements and things like that." P8 "Firstly loss of sleep, lack of concentration, if they are coming there with that they can make minor incidents or accidents." P9 "On whether fatigue affects incidents- No, not really hey." P16
	Stress	The state of emotional or mental strain.	"Because you sweat there it's a stress that job." P2 "Because a lot of guys they feel it's a hot seat and when they get there they start sweating and they really start sweating." P5 "That's also very stressful but yah it's pretty much you've got the weight of the team on your shoulders." P8 "I get very irritated, it doesn't affect how I work it affects how I talk to people." P8 "That would be dangerous with all the stress you adding more stress, you going to make incidents or accidents." P9
	Recklessness	"Recklessness involves understanding that a risk is incurred in taking (or omitting)	"Now some crane drivers are a bit reckless ok, they just hoist and they wanna go and not pay attention." P4

		an action, but nevertheless choosing to take it" (Merry, 2009, p.269).	"You have some reckless guys who tend to have more incident and accidents than others." P5 "Sometimes it happens people just climb there and they just move the crane. We have had incidents because of that." P16 "It's the negligence of the guy working on top unlocking the twist lock." P9
	Work Experience	Work experience refers to any skills an individual gains while performing duties in a particular occupation or field (Brown, 2014).	"The experience helps because the operators have worked on different vessels but incidents can still take place." P1 "The thing is we are lucky we have a lot of experienced operators. It helps." P1 "Uhm most of the accidents occur when they bring other crane drivers from other booths aren't used to this brand of crane." P7 "The first one was a misjudgement on my half I was a week on the crane I was told to do something by someone who should have known better." P8 "If you don't have the skills that the older crane drivers have you are going to battle, you will battle." P16 "I would say that an experienced operator is unlikely to have an incident I mean things do happen and it can still happen but not so often." P16
	Substance use	The misuse and overuse of drugs and alcohol.	"It would be nice if they were to do more test given a lot of people especially that do work here. Urine test for drugs." P8 "We had a guy early this year, he was intoxicated, he drove a straddle straight into a crane." P8 "Those people that smoke cigarettes and people that smoke marijuana and dagga in the corner of the cranes, you find little pieces all over the crane." P8

Table 15: Theme 4 (Personal Factors) - Summary of Crane Supervisors' Responses

Personal factors	Fatigue/Concentration	Extreme tiredness or exhaustion as a result of physical or mental exertion. / Focusing of energy or attention on a particular activity or object (Lerman, 2012).	"You need to be able to in the right form of mind." P11 "I would say that 90% of those are contributing factors towards accidents." P11 "Some accidents happened because that person his mind is not here when they are in the crane." P6 "We have to do like 32 boxes per hour but then we don't like put pressure on them that you have to do those 32 boxes." P3 "When you've got a stress or a personal issue you will not check and you will bang those people under the crane." P6 "My understanding is that when a person is not focused enough maybe that person may end up not hearing the radio and maybe the hatch man telling you not to pick up the certain box, you understand?" P10 "The only thing that they need to do is to concentrate on the work and listen to the radio so can be able to communicate with the hatch man and a controller that will prevent more accident." P10 "So if a person is not right emotionally things happen." P10 "He had a lot of pressure that he has to bring the boxes, he was very quick." (P.10) Yah he needed a big score so he had to make things fast. (P.10) "When you rushing you are about to course an incident you just need to be vigilant you need to." P11 "There is pressure there and some people are un able to work under pressure and that causes accidents." P11

			"Yes that can happen as well, although I have never worked with someone who say I have personal issues I'm stressed." P12 "There no pressure there because their target is 30 boxes per hour." P13 "Your concentration on the crane needs to be 100% all the time if you don't concentrate for a split second then you can damage something that's with the crane." P14 "It's an error in judgment. I mean it's not an easy job you know and I mean we are not machines we are only human, we make mistakes." P14 "We work on the hoof where there is like three cranes and you want to beat each other, there's competition between crane drivers." P14
	Stress	The state of emotional or mental strain.	"You need to be vigilant and you need to be able to work well under pressure because there are some people who are unable to work under pressure and that causes incidents so we cannot shift everything to the training."
	Recklessness	"Recklessness involves understanding that a risk is incurred in taking (or omitting) an action, but nevertheless choosing to take it" (Merry, 2009, p.269).	"Some of them drive recklessly. I don't think it's the lack of training but more to do with the personality." P11
	Work Experience	Work experience refers to any skills an individual gains while performing duties in a particular occupation or field (Brown, 2014).	"The other danger of course the new people when they arrive at the crane they must give them a chance to improve themselves." P6 "I think that some of the new operators because we have newly passed operators haven't got the years of experience and I think that's one of the main issues especially when it comes to wind issues. P15" "Yes, we do have a problem with someone passing out to drive the crane there will be those accidents happening during this new time in the crane, and we can lose the target because this guy is slow." P6

			"It's when the accidents happen or with a new crane driver." P10
	Experience as a Crane Operator	The skills and knowledge the individual gained while operating a crane (Brown, 2014)	"So it actually causes a clash whereby you know that from experience there are some things that cannot be avoided and obviously as a supervisor you have to separate from the two." P10 "As a former Crane Operator I know that you can't avoid it when that happens." P11 "I think if you are a supervisor and you've been an operator before you can't exactly force someone to work knowing exactly what they are talking so it becomes a challenge. P13 "They will tell the supervisor to tell the crane driver to carry on, but as a crane driver you know when things are unsafe." P14 "You get backlash from employees because we are acting supervisors, they are not really supporting the acting supervisor because we sometimes drive with them." P14
	Substance use	The misuse and overuse of drugs and alcohol.	"Drugs. They are full up here in this terminal. I know." P14 "Oh that guy was fired. He was under the influence of drugs, he was on drugs and he was not doing his work properly, falling asleep in the crane." P14
	Age		"Like here we work with young people and old people and those old people are difficult to make them understand if you come and tell them about safety they will tell you by that time they were doing things like this, that's why some of them don't want to understand." P12 "No we were working like this, now why do you come up with this now?" P12

4.6 Theme 4: Personal Factors

Personal factors are those factors that are specific to an individual. These factors often affect the individual's behaviour, such as personality or mental state. The sub-themes that emerged under the theme of Personal factors were fatigue, concentration, stress, recklessness, work experience and age. The above-mentioned factors are often under the control of the individual, for example the level of concentration and reckless behaviour are all actions that are carried out by the individual, and therefore the sub-themes under the theme of personal factors are viewed as internal (dispositional) factors.

4.6.1 Fatigue/concentration

Fatigue occurs when an individual is extremely tired due to mental or physical exertion (Lerman, 2012). In the context of our current study, fatigue can result from issues with the shift schedule such as the night shift or long and extended shifts. Operators can also report for work tired and without having rested enough, which leads to concentration problems. Fatigue results in concentration difficulties where an individual is unable to focus on a task. The results of the thematic analysis show that the theme of concentration emerged in both Crane Operators and Crane Supervisor groups. However, there are differences in the attributions of both groups. The Crane Operators expressed that fatigue and concentration affect their performance when operating a crane, however they do not believe that fatigue and concentration can result in crane incidents. In contrast, Crane Supervisors expressed that fatigue and lack of concentration lead to crane incidents. Evidence of these findings was demonstrated in the below quotes from Crane Operators and Crane Supervisors:

Crane Operators:

> *"Ill tell you personally that on night shift and the early hours of the morning that's when you are a bit tired but I cant tell you if accidents happen then." P1*
>
> *"We've never really had an incident of a crane driver because his tired or anything like that." P4*
>
> *"Its night, your brain wants to shut down. But there's no example of tiredness or fatigue that really causes anything, well not that I know of." P5*

Crane Supervisor:

"Some accidents happen because that person his mind is not here when they are in the crane." P6

"The only thing that you need to do is to concerntrate on the work and listen to the radio so he can be able to communicate with the hatch man and controller. That will prevent more accidents." P10

"I would say that 90% of those that are contributing factors towards accidents." P11

4.6.2 Recklessness

Recklessness refers to a failure to give enough attention or care to a situation or to someone (Merry, 2009, p.269). Reckless behaviour is actioned by an individual under their own authority, therefore, recklessness is viewed as an internal (dispositional) factor. The results of the thematic analysis demonstrate that the sub-theme of negligence emerged from both groups of Crane Operators and Crane Supervisors. The two groups expressed different perceptions of the effects of recklessness on crane incidents. Three of the Crane Operators expressed that negligence/reckless behaviour contribute towards crane incidents in contrast to just one Crane Supervisor who expressed that recklessness contributes towards crane incidents. Under this sub-theme, it was observed that Crane Operators attributed crane incidents to internal (dispositional) factors whereas Crane Supervisors didn't make the same internal attributions. This was demonstrated in the below quotes from the Crane Operators and one Crane Supervisor:

Crane Operators:

"Now, some crane drivers are a bit reckless ok, they just hoist and they wanna go and not pay attention." P4

"You have some reckless guys who tend to have more incident and accidents than others." P5

"Sometimes it happens that people just climb there and they just ove the crane. We have had incidents because of that." P16

Crane Supervisors:

"Some of them drive recklessly. I don't think it's the lack of training but more to do with personality." P11

4.6.3 Work experience

Work experience refers to the amount of time that one has spent at the organisation and in the job as a Crane Operator. Worker experience is related to the level of skill and knowledge that is associated with performing the job. The level of experience that a worker has acquired is specific to each individual and is dependent on the amount of time that the individual has dedicated into refining their skill, therefore, this factor is viewed as an internal factor. The results from the thematic analysis demonstrate that worker experience emerged as a theme in both groups of Crane Operators and Crane Supervisors. Both groups expressed that lack of experience contributed towards crane incidents and this was demonstrated in the following quotes from Crane Operators and Crane Supervisors:

Crane Operators:

> *"Uhm most of the accidents occur when they bring other crane drivers from other booths who arent used to this brand of crane." P7*

> *"An experienced operator is unlikely to have an incident, I mean things do happen and it can still happen but not so often." P16*

Crane Supervisors:

> *"Yes, we do have a problem with someone passing out to drive the crane, there will be those accidents happening during this new time." P6*

> *"I think its one of the main issues especially when it comes to wind issues." P15*

4.6.4 Experience as a Crane Operator

Some of the Crane Supervisors in the group had previous experience as Crane Operators and this past experience affected the manner in which they processed information and made attributions as demonstrated in the below quotes from Crane Supervisors:

> *"So it actually causes a clash whereby you know that from experience there are some things that cannot be avoided and obviously as a supervisor you have to separate from the two." P10*

> *"As a former Crane Operator I know that you can't avoid it when that happens." P11*

Crane Supervisors with prior crane operator experience struggled to make attributions because they were confronted with information from their causal schema which was developed during

their time as Crane Operators and the new information they have obtained as Crane Supervisors.

4.6.5 Application of Attribution Theory to Personal Factors

The results under theme 4 show that there are differences and similarities in Crane Operators and Crane Supervisors' perceptions on incident causation in relation to personal factors. Under the sub-theme of concentration/fatigue, Crane Supervisors perceived that concentration/fatigue had an impact on crane incidents whereas Crane Operators didn't believe that these factors impacted on crane incidents. This demonstrated that Crane Supervisors were inclined to place the responsibility for crane incidents on the Crane Operators' loss of concentration and fatigue. In contrast, the results for the sub-theme of recklessness showed that Crane Operators felt that the reckless behaviour of their fellow Operators was to blame for crane incidents with only one supervisor finding the behaviour of Crane Operators reckless. The results under work experience were similar for both groups and no significant differences in their perceptions were observed with both groups perceiving work experience as having an impact on crane incidents. To unpack the contradictory results obtained within the theme of personal factors, the researcher will explore the motivations of the Crane Operators and Crane Supervisors, the influence of cultural background on attributions and the context in which these attributions have been made – blame culture.

a. Motivations and Personal Factors

As established numerous times within attribution research and within the current study, motivations affect the way in which attributions are made (Kelley, 1972; Gronhaug & Falkenberg, 1994). By examining the motivations of the two groups in the study, the researcher can begin to understand how the Crane Operators and Crane Supervisors perceived the different personal factors. It is important for Crane Operators to believe that they have control over personal factors such as concentration and fatigue because this gives them the assurance that they have control over their work performance and that with enough effort, they can reach their goals and targets.

The Crane Operators are also motivated to present 'self' in a positive manner by attributing negative outcomes such as crane incidents to factors outside of themselves. This motivation to present oneself in a positive manner is also associated with maintaining one's self-esteem

(Feather & Simon, 1971). To further understand self-esteem, the cultural backgrounds of the two groups are considered.

b. Cultural background and Self-Esteem

According to Markus & Kitayama (1991, 1994) & Tafarodi & Walters (1999), an individual's cultural background has an effect on their source of self-esteem. The Crane Operators who were mostly from individualistic cultures may find their individualism and separation from others as a source of self-esteem motivating them to perceive their fellow Crane Operators as being separate from them and thus making attributions that show their distinction to other Crane Operators. This was demonstrated in the results within the theme of Personal Factors where Crane Operators felt that their colleagues' reckless behaviour and drug usage contributed towards crane incidents. It should be noted that the Crane Operators never perceived themselves as being reckless, but rather identified "they" as being reckless and responsible for crane incidents. The opposite can be said about Crane Supervisors who are mostly from collectivistic cultures. The Crane Supervisors may find the sacrifice of their individual goals for the sake of group harmony as a source of self-esteem and thus make attributions that will maintain their self-esteem by making attributions that won't place the blame on their sub-ordinates. This notion that the Crane Supervisors prefer to make attributions that don't place the blame on Crane Operators can still apply to the sub-theme of concentration or fatigue. This is because although the Crane Supervisors found that concentration and fatigue made an impact on crane incidents, the behaviour was not necessarily intentional on the part of the Crane Operators. Being fatigued and difficulty with concentration are seen as factors that are influenced by situational factors and not done intentionally by the Crane Operators, therefore the internal attributions would not come with severe punitive action.

c. Blame Culture and Self-Defensiveness

Crane Operators mostly made self-defensive attributions with regard to personal factors. As mentioned previously in the study, the motivation to protect the self-esteem has an effect on the attributions of crane operators. This motivation becomes more intense when combined with the motivation to avoid blame and punishment in an organisation with a punitive / blame culture. The Crane Supervisors diminished the role of personal factors in crane incident causation to avoid punishment that comes with crane incidents and incident investigations.

The results under the theme of personal factors demonstrate how the attributions of workers can distorted by different factors in their environment as well as their personal motivations.

These distorted attributions result in inaccurate information being collected during crane incident investigations resulting in inaccurate remedial interventions.

4.7 Additional Findings

4.7.1 Gender and Hierarchical position

In the current study, the results show that female supervisors are more inclined to make internal attributions than their male counterparts. The female Supervisors cited the most internal causal factors for incidents and they were the only two Supervisors to cite both negligence and fatigue as causal factors for crane incidents. This finding is in contradiction to the study by Koubenan and colleagues (2001) where they observed an interaction between sex and hierarchical position in their study on attributions. Their findings showed that males are more inclined to make internal causal attributions more than females. The findings in the current study could be influenced by the fact that the maritime industry is male dominated and male Crane Supervisors share personal characteristics with the Crane Operators. The female supervisors may have less in common with the males, causing them to see the Crane Operators as non-relevant and thus affecting the way they are perceived by the female Supervisors.

4.7 Conclusion

In Chapter 4, the results that emerged from the collected data were presented and discussed. The themes and sub-themes that emerged were based on the research questions stated at the beginning of the Chapter. Throughout the chapter, the perceptions of Crane Operators and Crane Supervisors were compared to see whether there were differences in their perceptions based on the different characteristics and circumstances of the two groups within the organisation. According to previous literature on attribution theory, the researcher had hypothesised that Crane Operators and Crane Supervisors would have different perceptions with regards to crane incidents based on their different hierarchal levels and work contexts. The results of the study were similar to those of the hypothesis, however there were also some differences to previous literature on attribution. There were instances where the Crane Supervisors were in support of Crane Operators and at times protective of them. This was found to be due to the cultural backgrounds of the Crane Supervisors which was collectivistic in nature. Individuals from collectivistic cultural groups are more inclined to prioritising in-group harmony and the goals of the group over their own, therefore, the characteristics of the Crane Supervisors, likely affected how they perceived crane incidents. In addition, the gap between the hierarchical levels affected the results of the research study. The comparison was made on

two groups which saw one another as part of one team and in the words of Crane Operators ‘a family’. The two groups worked in close proximity to one another and experienced similar challenges. By comparing groups that were similar and close in terms of hierarchical level yielded results that might not apply in comparing the perceptions of sub-ordinates and supervisors in other work situations. Despite the results being different to the hypothesis, the application of attribution theory principles was still vital in the unpacking of the worker’s different perceptions. This shows that attribution theory principles can easily be applied to any context and can explain and predict the way people make attributions based on the various factors discussed throughout the paper.

CHAPTER 5: CONCLUSION

5.1 Introduction

Chapter 4 above provided the results of the research study on Crane Operators' and Crane Supervisors' perceptions of incident causation. In the current chapter, the researcher will conclude the research study by providing 1) a brief summary of the study, 2) the main findings of the research study, 3) recommendations, 4) the limitations and; 5) the recommendations for future research.

5.2 Summary of the Research Study

The aim of the current research study was to analyse and compare Crane Operators' and Crane Supervisors' perceptions on incident causation by the application of attribution theory. A qualitative research approach was used to enable the researcher to confirm the hypotheses provided by the literature on attribution theory and to explore any further factors that may influence the perceptions of Crane Operators and Crane Supervisors on crane incidents. In this way, the research was both inductive and deductive. The researcher used semi-structured interviews to collect the data and used thematic content analysis to analyse the data. The results of the study were presented in Chapter 4 along with a discussion of the findings. A consolidation of the findings will be presented in the following section.

5.3 Main Findings

Based on the results and discussion presented in the previous chapter, it is evident that the application of attribution theory is relevant and useful in analysing and comparing workers' perceptions on incident causation. The results show that factors such as motivations, information, beliefs, demographic factors, hierarchical level, cultural background and work experience to name a few, have an impact on the way perceivers make attributions.

Despite the dated research of classical attribution theorists, the theory of attribution is still applicable in today's world of work. The work of Heider (1958), Jones and Davis (1965) and Kelley (1967) were useful in exploring and understanding how different attributions are made based on a number of factors and circumstances. Heider's (1958) theory showed how proximity and similarities can affect workers' perceptions. In the current study, the researcher was able to demonstrate how similarities in the Crane Operators' and Crane Supervisors' work environments, cultural background and work experience influenced the two groups' attributions. The researcher was also able to demonstrate how working closely and in the same

area can affect how workers view each other. When working closely together, workers begin to relate to each other in several ways and this makes them consider their co-workers' vulnerabilities as their own. In other words, they put themselves in the others' shoes. Although there is a difference in the hierarchical level between Crane Operators and Crane Supervisors, their level of proximity to each other is still fairly close within their work environment. This proximity, as well as the cultural background of the Crane Supervisors' may affect the objectivity of Crane Supervisors when making attributions on crane incidents. In the current study, Crane Supervisors were prone to making attributions that protect the Crane Operator from blame because of their proximity to them. The blame culture of the organisation may have also reinforced this behaviour of being protective because most crane incidents result in disciplinary hearings where Crane Operators can lose their jobs.

Jones and Davis' (1965) theory enabled the researcher to demonstrate how Crane Supervisors used ability and knowledge to determine whether the Crane Operators' actions were intentional during crane incidents. By determining the intention or lack thereof, Crane Supervisors made internal or external attributions for the actions of the operators. This was demonstrated under the sub-theme of communication where Crane Supervisors found that Crane Operators intentionally misused the radio and didn't communicate effectively because they had the ability and knowledge on how to communicate effectively over the radio. In this situation, the Crane Supervisors attributed communication problems to the actions of Crane Operators.

Kelley's (1976) model was also used by the researcher to break down how Crane Operators and Crane Supervisors perceive actions and situations by considering three aspects of behaviour namely consistency, distinctiveness and consensus. Kelley's Multiple Sufficient Cause Schema was also key in understanding how certain factors were selected over others when making attributions (Kelley, 1976). The Crane Operators and Crane Supervisors relied on causal schema to make attributions in a fast and economic way. The fast pace of the Port as well as tight deadlines influenced the Crane Operators and Crane Supervisors to perceive information quickly in order to carry on with their work tasks. This was done a lot and in many cases, the role played by other factors such as training was discounted in the causal attributions of crane incidents.

The results of the current study showed that cultural background as well as antecedent factors such as information and motivations play more of a role in influencing the attributions of Crane

Operators and Crane Supervisors. These factors along with organisational factors such as blame culture and safety culture were found to be the most prominent factors across both groups.

The Crane Operator and Crane Supervisor groups were made up of different ethnicities where the Crane Operators were mostly made up of English and Afrikaans speaking ethnicities with a more individualistic cultural background, and the Crane Supervisors were mostly made up of Zulu speaking individuals who were from a more collectivistic background. The cultural differences in the two groups produced results that were in contrast to previous research studies. The differences between the Crane Operators and Crane Supervisors were not as clear as predicted and this was mainly due to the collectivistic orientation of the Crane Supervisors who prioritised in-group harmony and relationships over their own personal work goals.

Overall the study showed that the cultural context of the organisation affects the manner in which incidents are perceived. Individuals from different cultural backgrounds have different sources of self-esteem and thus will be motivated by different factors to maintain that self-esteem. Attribution theory demonstrated the importance of maintaining one's self esteem and the implications of it on attributions.

By taking a systems thinking approach, the researcher was able to observe how organisational culture can indirectly affect crane incidents. Traditional methods of investigation often do not consider the effects of organisational culture on incident causation and when considered, the effects are downplayed. The current study was able to demonstrate how blame culture and safety culture affect the behaviours of workers during crane incidents and crane incident investigations. The effects were observed in both the Crane Operator and Crane Supervisor groups. The blame culture influenced Crane Operators and Crane Supervisors to make defensive attributions in order to avoid blame and punishment. Crane Operators often perceived that crane incidents were caused by other factors outside of themselves and Crane Supervisors often perceived that Crane Operators were not to blame for crane incidents as a way of protecting them from punishment.

In summary, the researcher was able to answer the research questions of the study by applying attribution theory. Crane Operators mostly attributed crane incidents to external factors with the exception of personal factors, where Crane Operators made more internal attributions than Crane Supervisors. In simple terms, Crane Operators mostly perceived that crane incidents were caused by situational factors with the exception of personal factors where more Crane Operators perceived that their colleagues' personal issues and behaviours such as recklessness

contributed towards crane incidents. The Crane Supervisors had similar attributions to the Crane Operators, in contradiction to Gyekye (2010), in that they placed the blame on situational factors most of the time with regards to crane incidents.

5.4 Recommendations

Based on the current research study, the researcher makes the following recommendations:

1) Incident Investigations should move away from focusing on human error and instead consider the socio-technical system of the Port. Factors such as the policies, communication, organisational culture and type of equipment procured should be taken into consideration at all times instead of just finding a person to blame for the incident.
2) Crane Operators', Crane Supervisors' and the Technical Team's accounts of what happened during crane incidents should be considered with caution, especially in an organisation with a blame culture such as the one observed in the current research study. Accounts of what happened will not be accurate because the accounts are based on perceptions and the perceptions are influenced by different factors.
3) Remedial actions should be less focused on disciplinary action and more focused on learning to allow the Crane Operators and Crane Supervisors to be more forthcoming and trusting when it comes to information on what truly happened. In other words, the culture of the organisation should be changed from a blame culture to that of a learning culture.
4) By creating an organisation with a learning culture and trust, Crane Operators would be more willing to report incidents and near misses, allowing the organisation to gather more data to come up with preventative measures and accurate remedial actions prior to incidents happening.
5) Attribution theory should be applied in incident investigations to give researchers a deeper understanding of the perceptions of the individuals involved.
6) More research should be conducted on the effects of cultural factors on attributions, especially in contexts where there are people from different ethnicities and cultural backgrounds. A lot of the research has been conducted in the context of western cultures with low ethnic and cultural diversity. It would be useful to discover how perceptions are made in more diverse contexts.

7) The combination of attribution theory and systems thinking approach should be adopted by future researchers who are interested in analysing incident causation and incident investigations as it can yield more in-depth information.

5.5 Limitations of the research

Limitations in this current research study are highlighted which could have impacted on the validity and reliability of the findings. Firstly, only semi-structured interviews were used to collect data. Using additional methods of data collection such as incident reports would have strengthened the reliability and validity of the study. The researcher attempted to gain access to information on the incident reports, however the organisation was not forthcoming. The other disadvantage of using interviews is that Crane Operators and Crane Supervisors may have responded in a socially desirable way creating social desirability bias (Moorman & Podsakoff, 1992). The researcher tried to mitigate this by making the participants feel comfortable and at ease to open up.

The interview questions were focused on general crane incidents and not a specific incident in which the Crane Operator and Crane Supervisor were involved. The implications of this is that the results may not be a true reflection of what usually happens when crane incidents take place in reality. When the Crane Operators are personally involved in crane incidents, questions around that specific incident would arouse a stronger sense of defensiveness because the questions would be directed at them personally. Personal questions are more linked to their self-esteem and therefore, the participants would be motivated to respond in ways that would maintain their self-esteem.

The type of data analysis used also came with limitations. Thematic content analysis leaves a lot of room for error because the analysis is done manually over a long period of time. During this time consuming process, information can get lost in the themes and sub-themes. To mitigate the disadvantages associated with thematic content analysis, the researcher continuously went back and forth between the transcripts and the data codes to ensure that no data was left out and that the themes and sub-themes were representative of the data collected.

An additional limitation was found in the sample of the study. Firstly, the Crane Operators and Crane Supervisors were mostly male with only three of the sixteen participants being female. This sample was representative of gender in the maritime industry, however, the same findings may not apply in other industries with a higher number of female workers. A sample with a higher number of females may have resulted in the Crane Supervisors making more internal

attributions because the two female Crane Supervisors in the group placed the blame on the personal characteristics and behaviour of Crane Operators in comparison to their counterparts. This prediction on gender is different to previous literature which showed that females are more likely to make external attributions (Gyekye & Salminen, 2007). Secondly, the ethnic composition within the groups was not diverse and representative of the population of the Port. Other teams within the Port had more diverse groups and thus the results of the group as a whole with more diversity may have yielded different findings due to the cultural background differences.

5.6 Recommendations for Future Research

The application of attribution theory to incident investigations is fairly new to the South African context, with only a few studies being carried out (Cajee, 2005). With that being said, the current research study has demonstrated the benefits of applying attribution theory to crane incident investigations which take different people's accounts of what happened into consideration. Since investigations take into account the perceptions of the technical team along with the accounts of the Crane Operators and Crane Supervisors, future research should explore the perceptions of technicians with regards to incident causation to provide a more holistic picture of the different perceptions involved. It is recommend that future research focus on specific crane incidents to allow the researcher to compare Crane Operators and Crane Supervisors' perceptions on the same incident, in accordance with current incident investigation processes. The inclusion of more data sources such as crane incident reports would give the study more reliability and validity. And, by doing so, the researchers would gain more insight into the socio-technical system of the port, thus gaining more in-depth information which can help with the development of more accurate remedial actions for crane incidents.

Future research should include Crane Operators and Crane Supervisors from different berths within the Port so that the results are representative of a larger population. By doing this, the external validity of the research study will be strengthened.

Lastly, researchers should employ both attribution theory and a systems thinking approach when carrying out research on incident investigations and incident causation because the current study has shown how valuable it is to combine both methods when trying to understand how operators and supervisors perceive incidents.

5.7 Concluding Remarks

This paper was able to show the inaccuracies which exist in the current method of data collection during incident investigations and also provide a foundation for future research on the topic. It supports the notion that incident investigations should move away from human error analysis and focus more on the entire socio-technical system in order to identify the true causes of incidents. By analysing the relevant factors which contribute towards crane incidents within the organisation, crane incidents can be prevented and reduced.

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Appendix A: Participant Information Sheet

Participant Information Sheet

Psychology
School of Human & Community Development
University of the Witwatersrand
Private Bag 3, Wits, 2050
Tel: 011 717 4503 Fax: 011 717 4559

Dear Sir / Madam

Good day! My name is Jessie Mashapa and I am currently completing my Masters' degree at the University of the Witwatersrand, Johannesburg. I am conducting a research project that will be investigating how crane operators and supervisors understand the causes of common container incidents in ports. Crane operators and supervisors often have different ideas about what causes incidents, and I would like to further understand these differences so that we can find recommendations that will improve workplace safety policies and incident investigations. I would like to invite you to participate in the study.

What will you have to do if you take part in the research study?

1. Sign a consent form to participate in the study and another to be audio recorded to allow the researcher to record the interview and therefore be able to listen to you without the distractions of writing everything. Recording the interview will enable the researcher to record complete and accurate information given by the participant. Please note that recordings will be transcribed and kept in a password locked file.
2. Complete a consent form to allow the researcher to use direct quotes. Please note that for confidentiality purposes, no names or employee positions will be used.
3. Avail yourself to meet with the researcher at your place of work for a private once-off, face-to-face interview at a time convenient to you.

How much of your time will it take to participate in the research study?

The interview will take no more than 45 minutes to complete.

Do you have to take part in the study?

No, it is completely voluntary to take part in the study. You will be allowed to withdraw your participation at any time during the research study until the report has been submitted for examination.

What are the advantages and disadvantages of participating in the study?

The information you provide can help us improve your safety and that of the organisation, in addition to the process of incident investigations at the port terminal. There are no direct benefits or disadvantages of participating or choosing not to participate.

Will your participation in the study remain confidential and anonymous?

Yes, a pseudonym will be used throughout the reporting and not your real name. Only the researcher will know your true identity. Only group results will be reported so that no individuals are singled out. The researcher and research supervisors will be the only individuals to have access to the recordings and transcripts.

The recordings and transcripts will be stored securely in a password locked file.

Questions about the research?

Should you have any questions regarding the research study, please contact the researcher using the contact details provided below. The researcher will be available to provide you with any information related to the research study. Summarised feedback will be provided to the organisation after completion.

Thank you for considering taking part in the research project. Please detach and keep this sheet for future reference.

Researcher:
Ms. Jessie Mashapa
(postgraduate student)
Cell: 081 55 77 677
Email: Jessie.mashapa@gmail.com

Supervisor:
Ms. Jessica Hutchings
Tel: 083 978 92999 / 011 717 7491
Email: Jessica.hutchings@wits.ac.za

Appendix B: Participant Consent Form (Interview)

Psychology
School of Human & Community Development
University of the Witwatersrand
Private Bag 3, Wits, 2050
Tel: 011 717 4503 Fax: 011 717 4559

Consent Form (Interview)

I, _____ consent to being interviewed by Jessie Mashapa, for her study exploring Crane Operator and Supervisor's perceptions of incident causation. I understand that:

- Participation in this study is voluntary.
- I may refrain from answering any questions.
- I may withdraw my participation and/or my responses from the study at any time.
- There are no risks or benefits associated with this study.
- All information provided will remain confidential, although I may be quoted in the research report.
- If I am quoted, a pseudonym (Respondent X, Respondent Y etc.) will be used.
- None of my identifiable information will be included in the research report.
- I am aware that the results of the study will be reported in the form of a research report for the partial completion of the degree, Masters in Industrial/Organisational Psychology.
- The research may also be presented at a local/international conference and published in a journal and/or book chapter.

Signed:_____

Date: _____

Appendix C: Participant Consent Form (Recording)

Psychology
School of Human & Community Development
University of the Witwatersrand
Private Bag 3, Wits, 2050
Tel: 011 717 4503 Fax: 011 717 4559

Consent Form (Voice Recording)

I, _____ give my consent for my interview with Jessie Mashapa to be audio recorded for her study exploring Crane Operator and Supervisors' perceptions of accident causation. I understand that:

- The tapes and transcripts will not be seen or heard by anyone other than the researcher and her supervisors.
- The tapes and transcripts will be kept in a safe place for three years and will be destroyed thereafter.
- No identifying information will be used in the transcripts or the research report.
- Although direct quotes from my interview may be used in the research report, I will be referred to by a pseudonym (Respondent X, Respondent Y etc.)

Signed: _____

Date: _____

Appendix D: Interview Schedule Crane Operator

1.	**DEMOGRAPHIC DETAILS**	
		FIELD NOTES
1.1	**Age:**	
1.2	**Job Title:**	
1.3	**Permanent/ contract worker:**	
1.4	**Department:**	
1.5	**Gender:**	
1.6	**Ethnicity:**	
1.7	**Home language:**	
1.8	**Educational level:**	
1.9	**Qualifications:**	
2.	**GENERAL**	
2.1	Years of experience in the organisation	
2.2	Years of experience in the current position	
2.3	Can you tell me about a day in the life of a crane operator (step by step)?	
3.	**CRANE INCIDENTS**	
3.1	What is your understanding of a crane incident?	
3.2	Can you give me some examples of a typical crane incident?	
3.3	From your experience, how often do these incidents take place?	
3.4	From your experience, is there a particular time in the day or shift that crane incidents commonly occur?	
3.5	Have you been involved in a crane incident? If yes, what happened? What caused the incident?	
3.6	Do you know anyone who has been in a crane incident? If yes, what happened?	
3.7	What are the consequences for employees involved in a crane incident?	
	FACTORS	
4.	**JOB RELATED FACTORS**	
4.1	Would you say that job factors, for example the design of the cabin, the amount of time spent in the crane, tight deadlines, shifts system or work stress contribute to crane incidents? If yes, please explain further.	

4.2	Would you say that communication with team members is an issue for crane operators? If yes, please explain further. Would this contribute to the occurrence of crane incidents?	
4.3	What other job factors could play a role in the occurrence of crane incidents?	
4.4	Probe Q: So would you say that you have not heard of a crane incident that was caused by these factors?	
5.	**ENVIRONMENTAL FACTORS –PHYSICAL**	
5.1	Would you say that physical environmental factors such as weather conditions are an issue for crane operators? If yes, please explain further.	
5.2	Would you say that physical environmental factors inside the cabin such as the temperature and height are an issue for crane operators? If yes, please explain further.	
5.3	In your experience, have any of these issues contributed to crane incidents? If yes, please explain further.	
5.4	Probe Q: So would you say that you have not heard of a crane incident that was caused by these factors?	
6.	**ENVIRONMENTAL FACTORS - ORGANISATIONAL**	
6.1	How would you define the organisations' attitude towards safety?	
6.2	Would you say that employees have a good understanding of the safety policies and procedures and are the procedures followed? Please explain further.	
6.3	Are crane incidents always reported? Please explain further?	
6.4	Can you think of any reason for people's lack of reporting / good reporting?	
6.5	How would you describe the safety culture of the organisation? For example, trust or blame culture?	
6.6	Are there any consequences for employees who are not following the safety procedures? If yes, please explain further.	
6.7	In your opinion, would you say that safety issues contribute to the occurrence of crane incidents?	
6.8	In your opinion, do you think that the organisation does enough when they are recruiting and selecting crane operators to prepare them for the job? Eg. A requirement like	

	experience, not being scared of heights, vertigo etc..	
6.9	Is there anything you would do differently when recruiting and selecting crane operators?	
6.10	Have you received any training related to your current role?	
6.11	Is the Training given to crane operators enough to help them perform their jobs safely?	
6.12	Would you say that training or lack of training contributes to crane incidents?	
6.13	Probe Q: So would you say that you have not heard of a crane incident that was caused by any of these factors?	
7.	**INDIVIDUAL FACTORS**	
7.1	Are individual issues such as fatigue, lack of concentration, skills and experience an issue for crane operators? If yes, please explain further. Would you say that these contribute to the occurrence of crane incidents?	
7.2	Probe Q: So would you say that you have not heard of a crane incident that was caused by factors such as fatigue, lack of concentration, skills and experience?	
8.	**RECOMMENDATIONS**	
8.1	What do you recommend the organisation should do to improve crane incident safety? What do you recommend that employees can do to decrease crane incidents	
9.	**CLOSING**	
9.1	Thank you. Is there anything you would like to tell me that I haven't asked which will be valuable to this study?	

Appendix E: Interview Schedule Crane Supervisor

1.	**DEMOGRAPHIC DETAILS**	
		FIELD NOTES
1.1	**Age:**	
1.2	**Job Title:**	
1.3	**Permanent/ contract worker:**	
1.4	**Department:**	
1.5	**Gender:**	
1.6	**Ethnicity:**	
1.7	**Home language:**	
1.8	**Educational level:**	
1.9	**Qualifications:**	
2.	**GENERAL**	
2.1	Years of experience in the organisation	
2.2	Years of experience in the current position as a supervisor?	
2.3	Do you have experience as a crane operator? If yes, for how long?	
2.4	Can you tell me about a day in the life of a crane supervisor (step by step)?	
3.	**CRANE INCIDENTS**	
3.1	What is your understanding of a crane incident?	
3.2	Can you give me some examples of a typical crane incident?	
3.3	From your experience, how often do these incidents take place?	
3.4	From your experience, is there a particular time in the day or shift that crane incidents commonly occur?	
3.5	Why do you think that crane incidents occur?	
3.6	Have you been involved in a crane incident? If yes, what happened? What caused the incident?	
3.7	Do you know anyone who has been in a crane incident? If yes, what happened?	
4.	**SUPERVISION**	
4.1	What challenges do you face as a supervisor? (with regards to crane incidents)	
4.2	In your opinion, how important is supervision in the prevention of crane incidents? Please explain further.	

4.3	Are supervisors able to identify potential risk factors in crane operators with regards to crane incidents?	
4.4	In your opinion, what can supervisors do to decrease the number of crane incidents?	
4.5	In your opinion, is the manner in which supervisors handle crane incidents sufficient? Please explain further?	
FACTORS		
4.	**JOB RELATED FACTORS**	
4.1	Would you say that job factors, for example the design of the cabin, the amount of time spent in the crane, tight deadlines, shifts system or work stress contribute to crane incidents? If yes, please explain further.	
4.2	Would you say that communication with team members is an issue for crane operators? If yes, please explain further. Would this contribute to the occurrence of crane incidents?	
4.3	What other job factors could play a role in the occurrence of crane incidents?	
4.4	Probe Q: So would you say that you have not heard of a crane incident that was caused by these factors?	
5.	**ENVIRONMENTAL FACTORS –PHYSICAL**	
5.1	Would you say that physical environmental factors such as weather conditions are an issue for crane operators? If yes, please explain further.	
5.2	Would you say that physical environmental factors inside the cabin such as the temperature and height are an issue for crane operators? If yes, please explain further.	
5.3	In your experience, have any of these issues contributed to crane incidents? If yes, please explain further.	
5.4	Probe Q: So would you say that you have not heard of a crane incident that was caused by these factors?	
6.	**ENVIRONMENTAL FACTORS - ORGANISATIONAL**	
6.1	How would you define the organisations' attitude towards safety?	
6.2	Would you say that employees have a good understanding of the safety policies and	

	procedures and are the procedures followed? Please explain further.	
6.3	Are crane incidents always reported? Please explain further?	
6.4	Can you think of any reason for people's lack of reporting / good reporting?	
6.5	How would you describe the safety culture of the organisation? For example, trust or blame culture?	
6.6	Are there any consequences for employees who are not following the safety procedures? If yes, please explain further.	
6.7	In your opinion, would you say that safety issues contribute to the occurrence of crane incidents?	
6.8	In your opinion, do you think that the organisation does enough when they are recruiting and selecting crane operators to prepare them for the job? Eg. A requirement like experience, not being scared of heights, vertigo etc..	
6.9	Is there anything you would do differently when recruiting and selecting crane operators?	
6.10	Have you received any training related to your current role?	
6.11	Is the training given to crane operators enough to help them perform their jobs safely?	
6.12	Would you say that training or lack of training contributes to crane incidents?	
6.13	Probe Q: So would you say that you have not heard of a crane incident that was caused by any of these factors?	
7.	**INDIVIDUAL FACTORS**	
7.1	Are individual issues such as fatigue, lack of concentration, skills and experience an issue for crane operators? If yes, please explain further. Would you say that these contribute to the occurrence of crane incidents?	
7.2	Probe Q: So would you say that you have not heard of a crane incident that was caused by factors such as fatigue, lack of concentration, skills and experience?	
8.	**RECOMMENDATIONS**	
8.1	What do you recommend the organisation should do to decrease the number of crane incidents? What do you recommend that employees can do to decrease crane incidents	
9.	**CLOSING**	

9.1	Thank you. Is there anything you would like to tell me that I haven't asked which will be valuable to this study?	

Appendix F: Organisational Access Letter

Psychology

School of Human & Community Development
University of the Witwatersrand
Private Bag 3, WITS, 2050
Tel: (011) 717 4500 Fax: (011) 717 4559

Kingsmead Office Park

Port Operations House

Stanger Street

DURBAN

4001

Dear Sir or Madam

REQUEST FOR ACCESS TO YOUR ORGANISATION

My name is Jessie Mashapa and I am a Masters student at the University of the Witwatersrand, Johannesburg. In order to fulfil the requirements for my Masters Degree in Industrial/Organisational Psychology, a research project needs to be conducted and completed. The study that I am conducting forms part of a bigger study conducted by the Transnet Centre of Systems Engineering (TCSE), at the University of the Witwatersrand, Johannesburg, looking at the recruitment, selection and training of crane operators. The part of the study that I will be working on aims to explore crane operators' and supervisors' perceptions of incident causation. Research has shown that operators and supervisors tend to attribute different factors to the causation of incidents and this study will look at the different attributions and the reasons thereof.

In order to examine this, data collection is necessary. Your institution and members of your institution, specifically crane operators and supervisors, would be of great benefit to me in the compilation of this data. I would be grateful if you would grant permission for access to your employees to invite them to participate in the study by taking part in one-on-one interviews.

The interviews will take approximately 45 minutes to complete for each participant. The interviews will be recorded and transcribed verbatim. Participation in this study is voluntary and participants may withdraw before the submission and examination of the research report. Consent forms will be provided to the participants to acquire their written consent. The organisation will not be named in the study. Employees will remain anonymous in the research report. The data will be analysed at group level so that no individual will be identified. Your organisation will receive the results of the study in the form of a summarised report. The results from this study may provide you with insight into the attribution of causes of crane incidents and how this information can be used to improve safety within the ports.

If you have any further questions, please feel free to contact me.

Regards,

Jessie Mashapa
Jessie.mashapa@gmail.com

Prof. Andrew Thatcher
Andrew.Thatcher@wits.ac.za

Jessica Hutchings
Jessica.hutchings@wits.ac.za