Investigating the relationship between interpersonal trust and innovation within a petrochemical organisation

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Abstract

It is generally accepted that innovation of product, services and/or technologies, whether gradual or radical, is a source of competitive advantage for new and existing businesses. Adapting to changes in a volatile global market environment is a prerequisite for the sustainability of any business. The primary objective of this study is to explore the relationship between the cognitive, affective, lateral and vertical dimensions of interpersonal trust and organisational innovativeness within the Sasol Polymers, Chlor Alkali Business.

In order to achieve the abovementioned objective, a literature review was conducted and a quantitative study undertaken using a target group of 189 individuals within the business. Primary data collection was undertaken in the form of a questionnaire which was compiled using items from standardised questionnaires published by previous researchers.

Interpretation of the data revealed that the respondents are only moderately positive about the levels of interpersonal trust and organisational innovativeness within the business. In addition to this, although no causal relationship is implied, the research results revealed a practically significant positive correlation between the overall lateral, vertical, cognitive and affective-based trust constructs and the overall organisational innovativeness construct.

The recommendation of this study centres on reinforcing all three facets of the trustworthiness construct mentioned in Meyer *et al*.'s (1995) model by constantly reminding people of the importance of "living" the Sasol Values. In addition to trustworthiness, the concept is further bolstered by firstly, ensuring that the competency and skills set gaps are identified and rectified, secondly, by continuously demonstrating caring behaviours and, thirdly, by ensuring that all interactions are governed by a set of accepted ethical behaviours.

Key words

Interpersonal trust, vertical trust, lateral trust, cognitive-based trust, affective-based trust, organisational innovativeness.

Opsomming

Dit word algemeen aanvaar dat innovasie in terme van produkte, dienste en/of tegnologieë, of dit nou vinnig of geleidelik gebeur, ‘n bron van kompeterende voordeel is vir nuwe en bestaande besighede. Aanpassing by verandering in ‘n hoogs veranderlike markomgewing is ‘n voorvereiste vir die volhoubaarheid van enige besigheid. Die primêre doelwit van hierdie studie was om die verhouding tussen die kognitiewe, affektiewe, laterale en vertikale dimensies van interpersoonlike vertroue te ondersoek binne Sasol Polymers, Chlor Alkali Business.

Om hierdie doelwit te kon bereik, in ‘n literatuurstudie gedoen en ‘n kwantitatiewe studie onderneem met ‘n teikengroep van 189 individue binne die besigheid. Primêre dataversameling is gedoen by wyse van ‘n vraelys wat saamgestel is met die gebruik van items uit gestandaardiseerde vraelyste wat deur vorige navorsers gepubliseer is.

Interpretasie van die data het getoon dat die respondente net matig positief is oor die vlakke van interpersoonlike vertroue en organisatoriese innovering binne die besigheid. Voeg hierby dat hoewel geen oorsaaklike verband geïmpliseer word nie, die navorsingsresultate getoon het dat daar ‘n prakties-betekenisvolle korrelasie bestaan tussen die oorhoofse laterale, vertikale, kognitiewe en affektief-gebaseerde organisatoriese innoveringskonstruk.

Die aanbeveling voortspruitend uit die studie sentreer om al drie fasette van die vertrouenskonstruk wat in Meyer et al. (1995) se model genoem word deur ‘n konstante herinnering aan mense van die belang van die ‘uitleef’ van die Sasol-waardes. Voeg by die vertrouenswaarde die feit dat die konsep verder versterk word deur in die eerste plek te verseker dat die vaardigheid en bevoegdheid en vaardigheidsgapings uitgewys en reggestel word, en tweedens, om deurgaans omgee-gedrag te demonstreer en derdens te verseker dat alle interaksie gestuur word deur ‘n stel aanvaarde etiese gedragspatrone.

Sleutelwoorde

Interpersoonlike vertroue, vertikale vertroue, laterale vertroue, kognitief-gebaseerde vertroue, organisatoriese innoverendheid

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Abbreviations

B2B	Business to business
$CaCl_2$	Calcium Chloride
Cl_2	Chlorine
CP	Chemically pure
DC	Diaphragm cell
H_2	Hydrogen
HCl	Hydrochloric acid
HR	Human resources
LMX	Leader-member exchange
MBC	Membrane cell
MIT	Manufacturing improvement team
Na_2CO_3	Sodium Carbonate
NaOH	Sodium Hydroxide
NWU	North-West University
OCB	Organisational citizen behaviour
OE	Operational Excellence
P&SM	Procurement and supply management
POS	Perceived organisational support
RTR	Risk taking in relationship
SHEQ	Safety, Health, and Quality

1 ORIENTATION AND PROBLEM STATEMENT

1.1 INTRODUCTION

Post-industrial organisations today are knowledge-based organisations and their success and survival depend on creativity, innovation, discovery and inventiveness (Martins & Terblanche, 2003:64).This is truer today than ever before. The slow recovery of the South African marketplace after the financial meltdown in 09', coupled with unprecedented increases in operating costs, has eroded the profitability of local businesses. This is particularly true of the local Sasol plastics producing businesses that operate predominantly within a mature, highly competitive environment.

Sasol leadership realised that the continual innovation of existing technologies and products represents a substantial competitive advantage to the organisation. I would take this one step further and suggest that it is a critical lever that should be used to ensure the continued sustainability and growth of its business. Failure to adapt to the rapid changes in the local and global environment would expose the organisation to the potential loss of markets share, under-utilisation and inefficient use of resources and a loss of established competitive advantages.

It is proposed that one of the antecedents for the creation of an innovative environment is the presence of a trust relationship across all levels and disciples in an organisation. Therefore the aim of this study is to investigate interpersonal trust and organisational innovativeness in a South African petro-chemical organisation.

1.2 BACKGROUND TO THE STUDY

Approximately four years ago Sasol realised that portions of their existing operations were being under-utilised. Although it was difficult to put exact figures to the loss in income, initial estimates put it in excess of R 1 billion. With an opportunity this large Sasol and its existing businesses, in particular, had a strong business case for the creation of an innovative environment. To achieve this, a change in the corporate strategic focus was needed and the Operational Excellence (OE) initiative was born.

One of the aims of this initiative is to harness Sasol's "hidden factory". Theoretically, in doing so, the company's workforce would be empowered to effect the positive and continual change required to realise the potential savings and improved production throughput it had

identified in its existing operating base. However, it appears as if varying levels of trust in the organisation continue to hamper the achievement of this goal.

The formation of the manufacturing improvement team (MIT) process, within the business units, is one of the mechanisms employed by the OE initiative to make business improvements. One of the basic principles, utilised in MITs, is that the existing workforce, given the opportunity and environment, have sufficient knowledge, experience and skills to identify, investigate and implement innovative changes in any given business. It is made up of artisan level employees from all the recognised disciplines which are temporarily seconded from their normal positions to partake in the improvement process. The structured process is lead by an impartial facilitator and utilises well known problem solving techniques to identify areas of improvement.

Once the areas of improvement have been identified, the team becomes responsible for implementing the changes required to realise the improvement in the process. In many cases, the members of the MIT are tasked with “thinking outside the box” and, therefore, are challenged and guided in their thought processes to generate and implement innovative solutions to everyday problems and operational challenges. However, to reach this point, trust has to exist between the group members as well as between the MIT members and their leaders.

1.2.1 Interpersonal trust as a concept

The trust construct in this research is centred, to a large extent, around the work of Mayer, Davis and Schoorman (1995). The reason for this is that their work, in the mid-1990s, contributed significantly to removing the confusion surrounding as to what trust is. Mayer *et al.’s* (1995) integrative model separated trust from trustworthiness, with the three characteristics of the trustee (ability, benevolence and integrity) appearing as the antecedents of trust (Colquitt, Scott & LePine, 2007:909). They also drew a distinction between trust as a situational state and trust as a personality variable, with trust propensity defined as a stable individual difference that affects the likelihood that a person will trust (Colquitt *et al.*, 2007:909-910). So how is trust defined?

There are many definitions of trust, but most contain common elements, including uncertainty of dependability, vulnerability of dependency, expectations that the trusted party will not harm the trustors, and willingness of trustors to assume risk with the trusted party (Lau & Liden, 2008:1131). As such, trust can be defined as a willingness to accept vulnerability based upon having positive expectations about other people’s intentions and

behaviours in situations which are interdependent and/or risky (Clegg, Unsworth, Epitropaki & Parker, 2002:409).

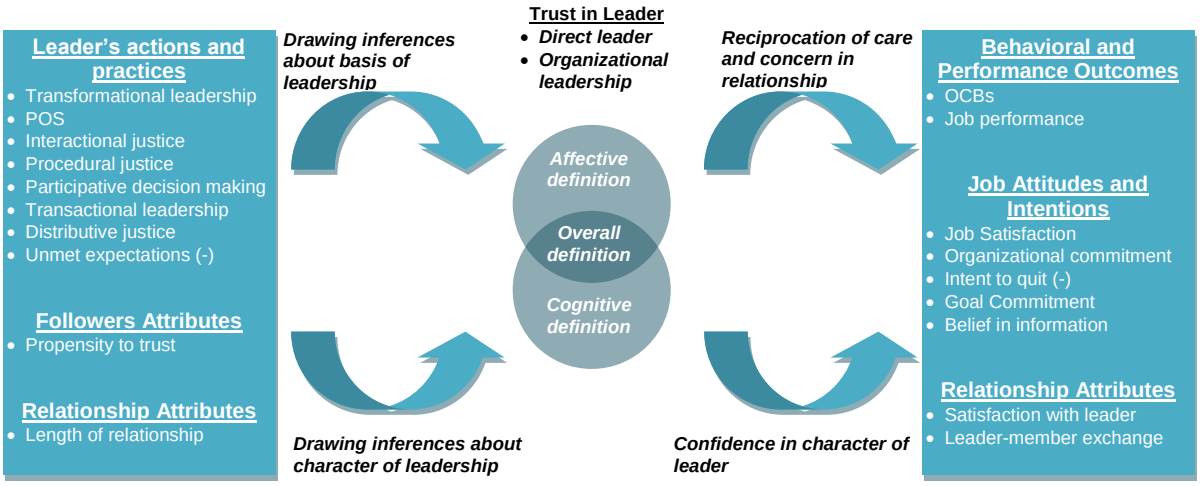


Figure 1: Dirks and Ferrin's proposed model of trust
(Source: Dirks & Ferrin, 2002:613)

For the purposes of this research only four dimensions of trust will be considered. These are cognitive, affective, lateral and vertical trust.

Cognitive- and affective-based trust

If the trust is based in rationality, an individual looks for rational reasons to trust a person, and the trust has a cognitive dimension. If the interaction between two parties is intensive, the relation of trust deepens, and those involved make a mutual, emotional investment to their relationship. In such a case trust has an affective dimension (Erdem & Ozen, 2003:132).

By its nature, the MIT process occurs within a temporary team and requires the full participation of members from diverse backgrounds, varying degrees of experience and different disciplines to be truly effective. A typical MIT team is made up of the individuals representing the four major maintenance disciplines, i.e. instrumentation, mechanical and electrical artisans along with representatives from the production and technical support departments. In this case, the possibility exists that the members making up the temporary work team have not had the opportunity to interact with one another on a regular basis. This means that a low probability of cognitive- or affective-based trust relationship amongst team members exists.

However the MIT process is structured and facilitated in a manner that encourages the creation of trust relationships among team members. This is achieved by encouraging intensive, open and honest interaction and information-sharing among team members. The process reward relies on giving recognition for good performance of team members. Team members are expected to adhere to the commitments given to the team members and any failures to perform are discussed and corrective actions implemented.

My selection of the cognitive- and affective-based trust is based on the premise that both forms of trust have a role to play in the creation of an environment conducive to innovation within the Sasol environment.

Lateral and vertical trust

Cognitive and affective trust dimensions can be broken down into a further two dimensions namely lateral and vertical trust. Lateral trust refers to trust within groups of employees while vertical trust refers to trust between employees and their leaders (Ellonen *et al.*, 2008:161 – 162).

It has been my experience that the initial phase of the MIT process is undertaken in an environment where low levels of trust are exhibited between the team members. As the process unfolds, and the process enters the implementation phase, the low levels of trust shifts from the team members to the leaders within the organisation. This severely hampers the creation and entrenchment of an innovative environment within the business unit.

For this reason I believe it is important to understand the extent of the correlation between horizontal and vertical trust and an innovative environment. This begs the question; what is organisational innovation? A basic overview of this construct is discussed in the following section.

1.2.2 Organisational innovativeness

How is innovation defined? According to the *Oxford Advanced Learner's Dictionary* (2010:774) innovation is defined as the introduction of new things, ideas or ways of doing things. A common understanding of innovation is that it may take many forms, such as product and process innovation, radical and incremental innovation, and administrative and technological innovation (Ellonen, Blomqvist & Puumalainen, 2008:162).

The innovation process usually depends on the successful implementation of three distinct practices. The initial phase involves a process of collaborative learning, idea generation and

finally the implementation of changes across all levels of the organisation. The effective execution of these practices requires individuals (and group) to make themselves vulnerable: either to the rejection of their ideas (and associated embarrassment); the lack of recognition from others (through their ideas not being taken seriously); or revealing ignorance (tacitly or explicitly) (Dovey, 2009:313).

Broadly speaking, innovation can be broken down into two dimensions, namely exploratory and exploitative innovation.

Exploratory innovations

Exploratory innovations are radical innovations and are designed to meet the needs of emerging customers or markets (Benner & Tushman, 2003:243), the most extreme form being the advent of a disruptive technology. This innovation is defined as a radically new scientific discovery providing organisations the capability and/or foundation for altering the business environment by destroying the value of the existing technical competencies and in the process, creating new business markets (Christensen, 1997). It is generally viewed as a process that an organisation undertakes to make radical changes to its products or services with the aim of improving its competitiveness. Within the Sasol environment, this type of innovative activity usually falls within the ambit of the highly skilled employees and/or service providers of an organisation with the understanding that a certain level of capital outlay may be required.

Exploitative innovation

Conversely, exploitative innovations are incremental innovations and are designed to meet the needs of existing customers and markets (Benner & Tushman, 2003:243). This type of innovation would typically be centred on how existing operations could make improvements to established products, operating units and services to increase the competitive nature of the business. The principle applied is based on using the existing resources, including the tacit knowledge of the workforce, to investigate and improve an identified area of a business's operations, ideally with minimal capital outlay.

1.3 PROBLEM STATEMENT

The causal factors underlying the study are as follows:

- Personal experience in leading a MIT process has highlighted the fact that low levels of trust between MIT members as well as members of the business leadership hamper the innovation process.
- High raw material costs, linked to the rising oil price, have detrimentally impacted on the profitability of the Chlor-Vinyls business. The optimal use of raw material and equipment is required to strengthen the future sustainability of the business.
- Relatively low employee turn-over rates have resulted in an experienced workforce with an abundance of tacit knowledge. Utilising this knowledge is crucial if the business wishes to achieve its goal of continually improving its operational performance. Without the correct climate that fosters trust, among the different members within the organisation, this will not be possible.
- The Chlor-Alkali business is a major consumer of electricity within the Sasol Polymers group. In line with ESKOMS requirements, one of the business' objectives is to achieve 10% electricity saving on agreed baseline usages by the end of the 2012 calendar year. Having a healthy innovative climate will aid the business in achieving this objective.
- The Chlor-Alkali Business employs relatively old technology to produce final products. Operating this equipment places a strain on the competitiveness of the business in a global market. The use of the employee's tacit knowledge and experience to stream-line operations, through the implementation of innovative solutions to bottle-necks, will improve the competitiveness of the business.

Given this context, the relationship between the identified aspects of interpersonal trust and organisational innovativeness begs to be explored within the Chlor-Alkali Business.

1.4 OBJECTIVE OF THE STUDY

1.4.1 Primary objective

The primary objective of the research is to explore the relationship between the cognitive, affective, lateral and vertical dimensions of interpersonal trust and organisational innovativeness within the Sasol Polymers, Chlor Alkali Business.

1.4.2 Secondary objective

To achieve the primary objective, the following secondary objectives had to be met:

The completion of a theoretical evaluation

A literature study was required for the following reasons:

- To define the concept of interpersonal trust
- To source a model of trust that includes the antecedents and outcomes of a trusting relationship.
- To clarify the cognitive- and affective-based dimensions of interpersonal trust.
- To clarify the lateral and vertical dimensions of interpersonal trust.
- To define the concept of organisational innovativeness including the exploratory and exploitative dimensions of the organisational innovativeness construct.
- To determine a desirable leadership style and associated behaviours that research has found to be supportive of trusting relationships and the creation of an innovative environment within a given organisation.
- To determine what team environment is most suited for the creation of an innovative environment.
- To source standardised questionnaires that could be used to investigate the nature and strength of the relationship between the selected dimensions of interpersonal trust and organisational innovativeness.

The completion of empirical research

The completion of empirical research is required for the following reason:

- To determine the nature and strength of the relationship between cognitive- and affective-base trust and organisational innovativeness within the Chlor Alkali Business
- To determine the nature and strength of the relationship between lateral and vertical trust and organisational innovativeness within the Chlor Alkali Business

Recommendations

A review of the results of the empirical research is required for the following reasons:

- To compare the empirical research results to the literature findings and make recommendations to the Chlor Alkali Business in view of the findings.

1.5 SCOPE OF THE STUDY

The study falls within the realm of organisational behaviour and will focus on the relationship between the selected dimensions of interpersonal trust and organisational innovativeness. The primary source of information, the empirical research will be conducted in a South African petro-chemical business, namely Sasol Polymers – Chlor Alkali Business. The business is situated on the Sasol Polymers Midlands site in the Free State.

In principle the population identified for the research was defined by the role they play in the business as it relates to the direct operation and maintenance of production. Included in the population were those individuals who are responsible for the implementation of improvement and maintenance project in the business. For this reason, the scope of the study will include all managers, engineers, technicians, technologists, discipline specialists and artisans across all the recognised disciplines. As such, the total population group is 189 people.

Excluded from the empirical research are those individuals who do not have a direct impact on the operation and maintenance of businesses assets. These people include HR, SHERQ P&SM and financial personnel. Although the literature review includes sections that discuss desirable leadership styles and behaviours that literature has found to be supportive of a trusting relationship and organisations innovativeness, the associated behaviours will not be measured in this research. These sections have only been included in this research documents to give a more comprehensive overview of the interpersonal trust and organisational innovativeness constructs.

1.6 RESEARCH METHODOLOGY

Both primary and secondary sources of information have been used for the study. The primary source of information is a quantitative empirical study focusing the nature and strength of the relationship between the selected dimensions of interpersonal trust and organisational innovativeness, conducted in the Chlor-Alkali Business. As stated above, the population group was defined by their role in the business as it relates to the direct operation and maintenance of production units. For the purpose of this research a non-probability convenience sample was taken.

Primary data collection was undertaken in the form of a questionnaire compiled using items from standardised questionnaires published by previous researchers. The questionnaires were compiled in such a way that the demographic information of the respondents could be

captured. The subsequent sections of the questionnaire consisted of items that established lateral, vertical, cognitive- and affective-based interpersonal trust and organisational innovativeness. Correlations between these aspects were explored.

The secondary sources used included but was not limited to books, peer reviewed articles and journals that contain information on the topics of innovation and interpersonal trust. Information was also sourced from the internet. Secondary sources included the use of scientific journals. Examples of these journals are the European Journal of Innovation Management, Journal of Organisational Change, Journal of Applied Psychology and The Academy of Management Review. Electronic searches were also done using scientific database search engines including Emerald Online, Google Scholar and Jstor.

1.7 LAYOUT OF THE STUDY

1.7.1 Chapter One: Orientation and problem statement

The aim of chapter one is to provide a background to the study as well as introducing the basic concepts of interpersonal trust and organisational innovativeness. The causal factors and objectives for the study are presented. The scope of the study is defined and a brief description of the research methodology is given.

1.7.2 Chapter Two: Literature study

Chapter two consists of a literature review focusing on selected aspects of interpersonal trust and organisational innovativeness. The first portion of the literature review focuses on interpersonal trust. Included in this section are definitions of the trust construct followed by a discussion on an agreed model of trust. The literature review on trust is concluded by a discussion on four aspects of interpersonal trust namely lateral, vertical, cognitive- and affective-based trust.

The second portion of the literature review focuses on organisational innovativeness. As with interpersonal trust, the first section focuses on defining organisational innovativeness. This is followed by a discussion of the exploratory and exploitative dimensions of organisational innovativeness. A portion of the literature focuses on appropriate leadership styles, leadership behaviours and team climates that researchers have found to be supportive of organisational innovativeness.

1.7.3 Chapter Three: Empirical investigation

Chapter three outlines the methodology employed during the empirical study. To place the study in context a brief discussion of the Chlor-Alkali Business is given. A quantitative empirical study is proposed and, as such, the chapter includes a discussion of the size of the target group as well the proposed sample technique employed for the study. The chapter also focuses on the compilation of a suitable survey instrument and ethical aspects that researchers have to bear in mind when undertaking a study of this nature.

1.7.4 Chapter Four: Empirical results

Chapter four discusses the empirical results achieved by the study. The starting point is a brief discussion of the demographics of the respondents followed by a determination of the reliability of the survey instrument. The remainder of the chapter focuses on interpreting the data based on suitable calculations conducted by a NWU statistical consultant.

1.7.5 Chapter Five: Conclusion and recommendation

Chapter five includes a discussion of the findings and conclusions drawn in relation to the theory presented in the literature survey, where possible. The research limitations are discussed and, based on the finding of the study, its contribution to academic knowledge discussed. Recommendations are also made to the Chlor Vinyls Business in view of the findings of the research.

1.8 CONCLUSION

It is generally accepted that innovation of product, services and/or technologies, whether gradual or radical, is a source of competitive advantage for new and existing businesses. Adapting to changes in a volatile global market environment is a prerequisite for the sustainability of any business. One of the conditions that has to be met for businesses to innovate is the creation of the right operating environment. Sasol and its existing businesses in particular, have a strong business case for the creation of an innovative environment; however varying levels of interpersonal trust in the organisation appears to hamper the achievement of this goal. It is proposed that one of the antecedents for the creation of an innovative environment is the presence of a trust relationship across all levels and disciplines in an organisation.

1.9 CHAPTER SUMMARY

The aim the study is to determine whether there is any positive correlation between the presence of trust relationships and the creation of a sustainable innovative climate in the business. Sasol has a substantial business case for the promotion of continuous innovation within its existing business as an additional source of competitive advantage. The chapter includes the introduction of the concept of interpersonal trust and its impact on the MIT process.

2 LITERATURE REVIEW

2.1 INTRODUCTION

This literature review addresses two main components namely trust and innovation. Both of these topics have been widely researched from a multitude of viewpoints, adding to the overall understanding of these topics. However, for the purposes of this research, the literature review will focus solely on those aspects of trust and innovation that have a direct bearing on the research topic. The conceptualisation of trust is discussed first and is followed by a discussion of innovation.

2.2 DEFINING INTERPERSONAL TRUST

The importance of trust for sustaining human relationship and organisational effectiveness in the workplace has been increasingly recognised in the past decades. Trust has been examined in different settings such as interpersonal trust, dyadic trust, inter-organisational trust, societal trust, peer trust in the workplace and trust in leadership (Surujlal & Zhang, 2009:125). The complexity of the construct as well as the multi-disciplinary approach to trust research has resulted in widely divergent and often confusing definitions of trust.

The reason for the confusion is eloquently summarised by Colquitt *et al.* They note that the multidisciplinary approach to defining the trust construct has resulted in varying views on what trust actually is. Some scholars view trust as a behavioural intention or internal action, while others saw it as synonymous with trustworthiness. Adding to the confusion is the fact that certain scholars view trust as a facet of personality, while others treat trust as a synonym for cooperation or risk taking (Colquitt *et al.*, 2007:909).

For the purposes of this research, I will focus on interpersonal trust as defined by Mayer, Davis and Schoorman (1995). The use of their model to explain the construct is a dominant theme in this document. Their model was chosen because it is a reasonably simple representation of an exceedingly wide-ranging and exceptionally complex subject. That is not to say that it captures all the aspects and dimensions of interpersonal trust; however, it does provide a solid starting point for this study. Incorporated in the literature review, is a basic overview of the levels of trust, along with certain outcomes of interpersonal trust relationships.

In the mid to late 1990s, two definitions of trust emerged which went a long way towards clarifying the confusion as to what the definition of trust is. The first of these was the

definition proposed by Mayer *et al.* (1995). He defined trust as: "The willingness of a party to be vulnerable to the actions of another party, based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer, Davis & Schoorman, 1995:712). The second definition was formulated by Rousseau *et al.* who defined trust as: "A psychological state comprising the intention to accept vulnerability, based upon positive expectations of the intentions or behaviours of another" (Rousseau, Sitkin, Burt & Camerer, 1998:395). These definitions found traction and general acceptance amongst research, and formed the basis for numerous subsequent definitions of trust, examples of which are given in Table1.

Table 1: Examples of trust definitions

Definition	Source
Trust is the opportunistic expectation by one person, group, or firm of the behaviour of another person, group, or firm in a common endeavour or economic exchange, under conditions of vulnerability and dependence on the part of the trusting party, for the purpose of facilitating cooperation between both parties that will result in an ultimate joint gain but, given the lack of effective contractual, hierarchical, legal, or social enforcement methods, with reliance upon a voluntary accepted duty by the trusted party to protect the rights and interests of all others engaged in the endeavour or exchange.	Hosmer, 1995:392 -393
The extent to which a person is confident in, and willing to act on the basis of, the words, actions, and decisions of another.	McAllister, 1995:25
An expectancy of positive (or nonnegative) outcomes that one can receive based on the expected action of another party in an interaction characterised by uncertainty.	Bhattacharya *et al.*, 1998:462
One believes in, and is willing to depend on, another party.	McKnight *et al.*, 1998:474
A psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviours of another	Rousseau *et a.l*, 1998:395
A willingness to accept vulnerability based upon having positive expectations about other people's intentions and behaviours in situations which are interdependent and/or risky.	Clegg *et al.*, 2002:409
The extent to which one believes that others will not act to exploit ones vulnerabilities.	Morrow *et al.*, 2004:49 - 50
A psychological state comprising the expectation that another will perform a particular action which is important to you, coupled with a willingness to accept vulnerability which may arise from the actions of that other party.	Six and Skinner (2010:11)

(Source: Researcher)

An analysis of Mayer and Rousseau *et al.'s* definitions, and the examples of the definitions given in the table above, reveals the two common components of trust. The first of these components is the *willingness of the trustee to be vulnerable* to the actions of the trustee. This is important as the implication is that without a level of vulnerability on the part of the trustor, trust between two parties cannot be developed.

As stated by Davis, Schoorman, Mayer and Tan (2000:564), when individuals take risks in a relationship with others, they become vulnerable to the party to whom they extend their trust. In other words the trustee has the perception of the subjective possibility of loss (Chiles & McMackin, 1996:80). Ultimately, without an element of risk, there would be no reason or need to trust (Lewis & Weigert, 1985:970).

In personal relationships, the willingness to be vulnerable to a partner is one of the cornerstones of a healthy relationship. This is no different to the working relationships found in all organisations. Ideally the employer/employee relationship is a partnership where both parties extract value from the relationship. Sasol depends on the skills, competencies, knowledge and experiences of the employee, to create value in a given business unit.

From a leadership point of view, individual business unit owners are held accountable for the safety of their sub-ordinates, maintaining the integrity of the assets, as well as the continued profitability and sustainability of the organisation. These individuals rely, to a large extent, on the performance of their subordinates to achieve personal goal and aspirations. Finally, they are held legally accountable for the safe operation of the business assets, and the well-being of their employees.

The workforce composition of Sasol employees ranges from individuals who are highly qualified, all the way through to semi-skilled labourers. It is interesting to note that in most production facilities, the day-to-day operations of the processing plants are operated and maintained by employees who are not that highly qualified. The plant systems are typically made up of expensive assets which, in some cases, process highly dangerous materials and maintenance activities may include work on large and dangerous equipment.

It becomes obvious that both parties in the leader-/sub-ordinate-relationship expose themselves to varying levels of risk on a daily basis through their interactions as a result of the business requirements. Understanding, accepting and managing this risk is central to maintaining the profitable operation of any business unit in Sasol. I suggest that this mutual exposure to risk, results in both parties being made vulnerable to one another. The effectiveness of the relationship is influenced by the level of vulnerability that both parties are willing to accept.

The second component is that of a *positive expectation*. The trust relationship should be mutually beneficial for both the parties involved. Obviously the trustee has a clear view and understanding of the benefits that will be accrued as a result of the relationship. However,

the trustor has an expectation that they'll not be taken advantage of, which requires the absence of opportunistic behaviour from the trustee (Six & Skinner, 2010:110).

Business unit owners in Sasol have the expectation that their employees are willing and able to utilise individual skills sets to further the organisational objectives and goals. The employees, on the other hand, have the expectation that their contributions will be fully recognised and the rewards associated with their efforts will be equitably distributed amongst all those who may, or may not, have contributed to the profitable operation of the business.

2.3 A MODEL OF TRUST

As mentioned before, Mayer *et al.'s* (1995) integrated model of organisational trust forms the backbone of the section of the literature review dealing with interpersonal trust.

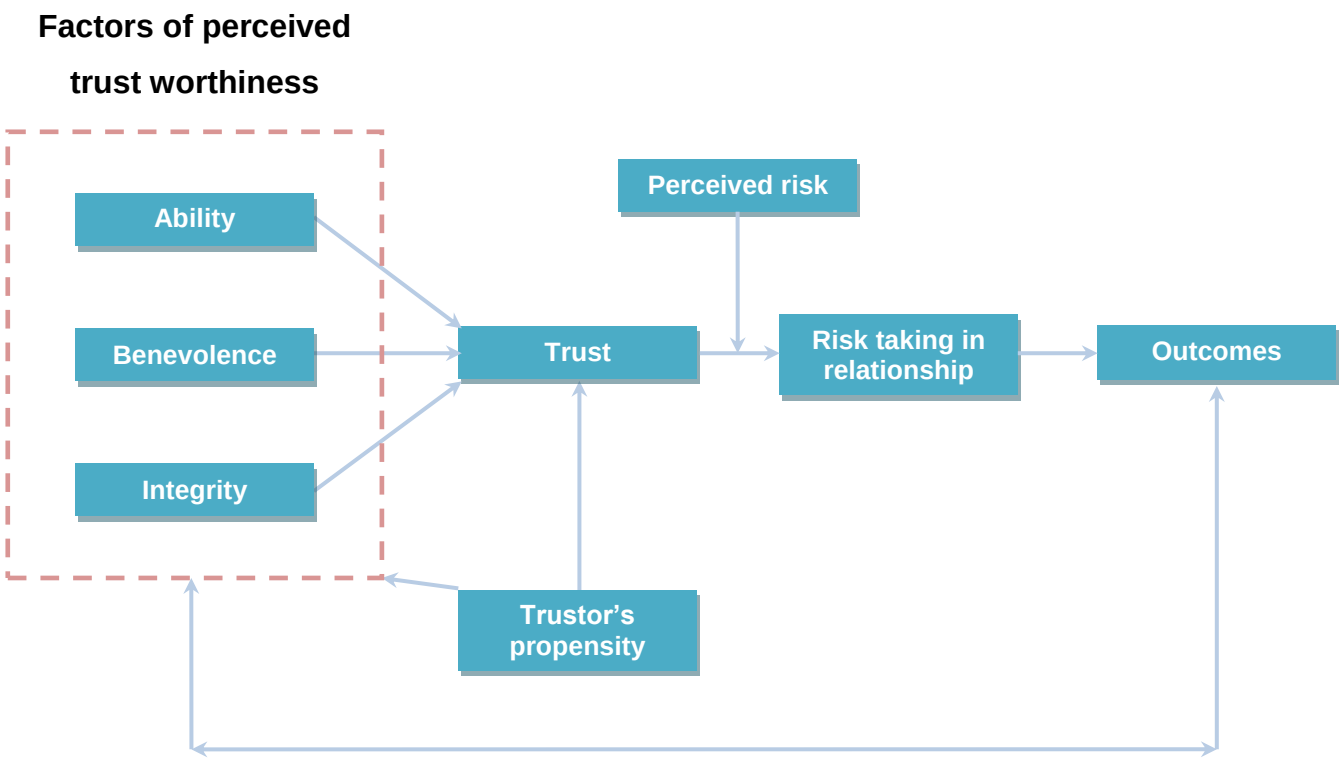


Figure 2: Mayer et al.'s model of trust
(Source: Mayer *et al*., 1995: 715)

The relatively simple model that they proposed is given above (see Figure 2) and will be used as the starting point in the formulation of a proposed model for interpersonal trust.

2.3.1 Antecedents of trust

Perceived trustworthiness

In explaining their theory of trust, Mayer *et al.* separated the concepts of trust and trustworthiness. As explained by Morrow, Hansen and Pearson (2004:50), trustworthiness is simply the perception held by one party (the trustor) that another party (the trustee) is worthy of trust. Therefore, such trustworthiness is a perceived characteristic of another party (the trustee). Simply put, trustworthiness is seen as an antecedent of trust. According to Mayer *et al.* (1995), the three facets of trustworthiness are the perceived ability, benevolence and integrity of the trustee.

- *Ability*. This is the perception that the trustee has the skills and competencies in the domain of interest. In other words, it is those attributes that increase an individual's chances of succeeding in a chosen endeavour.
- *Benevolence.* It is the trustor's (i.e. the trusting party's) perception that the trustee cares about the trustor. Mayer *et al.* (1995:719) describe benevolence as the perception of a positive orientation of the trustee towards the trustor.
- *Integrity.* This is the perception that the trustee adheres to a set of principles that the trustor finds acceptable (Mayer & Gavin, 2005:874).

The three characteristics mentioned above may be viewed as rather simplistic, and questions may be raised as to the few characteristics that make up the trustworthiness construct. However, Mayer *et al.* (1995) drew on the work of numerous researchers before ultimately settling on the characteristics of ability, benevolence and integrity. In a similar vein, Burke, Simms, Lazzara and Salas (2007:613) have argued that the predominant number of antecedents proposed within a larger literature base would fall within one of the above- mentioned categories. They submitted the following table to support their argument:

Table 2 Burke *et al.'s* comparison of factors impacting trust

Authors	Focus	Antecedents				
		Propensity	Ability	Benevolence	Integrity	Additional Constructs
Butler (1991)	Managerial trust	No	Competence	Loyalty, openness, receptivity, availability	Consistency, discreetness, fairness, integrity, promised, fulfilment	No
Mishra (1996	Trust in organisations Trust in leadership	No	Competence	Caring, openness	Reliability, openness	No
Sitkin & Roth (1993)	Trust in organisations	No	Ability	No	Value congruence	No
Whitener et al (1998)	Managerial trustworthy behaviour	Propensity to trust	Communication, sharing and delegation of control, perceived competence,	Demonstration of concern	Behaviour consistency, Behavioural integrity, perceived similarity	Task independence
Williams (2001)	General trust/groups	Motivation to trust	Ability, affect	Benevolence, affect	Integrity, affect	Organisational context (competition), in-group/out-group membership
Dirk & Ferrin (2002)	Trust in leadership	Propensity to trust	Unmet expectations, perceived organisational support	Interactional justice, perceived justice, participative decision making, transactional & transformational leadership, unmet expectations, perceived organisational support	No	Length of relationship, direct/indirect leadership

(Source Burke *et al.,* 2007:614)

Dispositional trust

According to Mayer *et al.* (1995), a trustor's propensity to trust is one of the antecedents of the intention of the trustor to trust. They defined the propensity to trust as a general willingness to trust others. This phenomenon will influence how much trust one has for a trustee prior to data on that particular party being available (Mayer *et al.*, 1995:715). McKnight *et al.* have put it another way. They suggest that the initial trust between the trustee and trustor is based on the trustor's disposition to trust, or on institutional cues that enable the two parties to build the trust relationship without firsthand knowledge (McKnight, Cummings & Chervany, 1998:474).

Gill *et al.* undertook a study which was published in 2005 with the intent to clarify the relationship between the antecedents of trust, as proposed by Mayer *et al.* (1995) and a trustor's intention to trust. Their findings suggest that the characteristic of the trustee (i.e. information about their ability, integrity and benevolence) influences a trustor's intention to trust (Gill, Bois, Finegan & McNally, 2005:292). However, in their attempt to find a boundary condition under which propensity to trust would predict intention, their study yielded some interesting results. Firstly they found that the relation between a trustor's propensity to trust is moderated by situational strength, and secondly they found that propensity to trust is positively correlated with intention to trust when information about the trustee was ambiguous (Gill *et al.*, 2005:297).

Based on the work by Ferrin and Dirks (2003:21 – 22), the following reasons are put forward as possible explanations. Firstly, they suggest that suspicions about the trustees' motives would cause the trustor to develop a lower level of trust in the trustee as a direct consequence of the suspicion and not the trustees' behaviour. In other words, people with a low propensity to trust are more likely to have a suspicion bias when processing information about a trustee's trustworthiness. Secondly, they suggest that the trustor may form trusting beliefs in the trustee by considering whether his/her own trust-related behaviours with respect to the trustee indicate a trusting belief.

2.3.2 Additional components of a trust model

Third party influence

It would be foolish to believe that relationships play themselves out in a vacuum. The same can be true when it comes to building trust relationships. People remain dependent on one another to achieve any given goal, or satisy personal wants and desires. Other than the trustor's propensity to trust, and the trustworthiness of the trustee, the influence of third parties has been shown to be an antecedent of interpersonal trust.

If what is stated above is true, what influence do third parties have on the formation of trust relationships? Ferrin, Dirks and Shah (2006) have found that an employee's trust in a co-worker is positively related to the number of third parties who were trusted by the employee and who simultaneously trusted the focal worker. They proposed that third parties transmit social information about trustworthiness beliefs among employees, and trust perceptions are affected via these third parties.

Research done by Lau and Liden (2008:1130) has found that, among the many types of third parties, the group leader, through his/her role as the official performance appraiser, reward distributor and mentor, has the potential to shape the immediate work environment and trust relationship of a co-worker.

Reciprocal nature of trust

As mentioned before, relationships rarely occur or grow within a vacuum, and therefore the reciprocal nature of trust implies an active process of exchange between parties, particularly when it results from a trustee's previous demonstration of trust. Serva *et al.* (2005) have suggested that reciprocal trust is not a distinct type of trust, but rather a process through which trust grows or diminishes. They define reciprocal trust as "the trust that results when a party observes the actions of another and reconsiders one's attitudes and subsequent behaviours based on those observations" (Serva, Fuller & Mayer, 2005:627).

2.3.3 The outcome of trust - The risk-taking relationship

Mayer *et al.* (1995) have proposed that the outcome of trust is risk-taking in the relationship with the trustee (Mayer *et al.*, 1995:725). In the words of Mayer and Gavin (2005): "More trust will lead to more risk taking behaviours on the part of the trustor. Rather than willingness to be vulnerable alone, the trustor's behaviour actually allows vulnerability to the trustee. Trust is a generalized behavioural intention to risk, whereas its outcome is actually taking risks" (Mayer & Gavin. 2005:874). If, as stated before, trust is the "willingness to take risks", then the level of trust is an indication of the amount of risk that the trustee is willing to take (Schoorman, Mayer & Davis, 2007:346).

The word "willingness" implies that sooner or later the trustor will have to make a decision about whether or not to trust the trustee. This decision is a judgement call about the trustee's trustworthiness or untrustworthiness, and will ultimately be based on the perceptions of the trustor and not the intentions of the trustee (Six & Skinner, 2010:111). It also implies that the trustee cannot be forced into a trust relationship, but is something that has to occur voluntarily.

2.4 LEVELS OF TRUST

Lateral trust refers to trust within groups of employees while vertical trust refers to trust between employees and their leaders (Ellonen *et al.*, 2008:161 – 162). The Figure below

gives a graphical representation of these two dimensions of trust in relation to institutional trust.

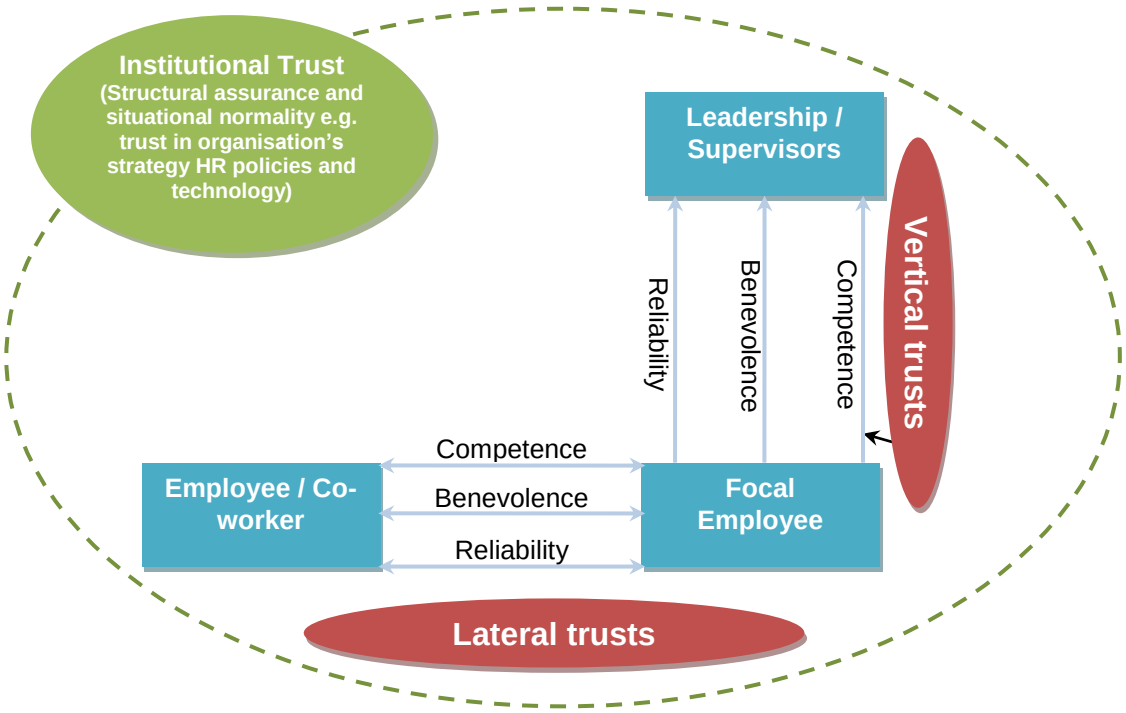


Figure 3: Lateral, vertical and institutional trust
(Source: Ellonen *et al*., 2008:163).

2.4.1 Lateral trust - Co-worker trust

Drawing on the conceptualization of trust by numerous scholars, Ferres, Connell and Travaglione (2004:610) state that co-worker trust concerns the confidence that co-workers are competent and will act in a fair, reliable and ethical manner, and that peers will support each other. They assume that co-workers will not take advantage of each other by withholding information and believe that co-worker trust would lead to employees acting on the basis that they have faith in the words and actions of their peers.

The model proposed by Costa (2003:609) is used as the starting point for a discussion of the consequences of co-worker trust (see Figure 4). The findings of her research suggested that, with the exception of *monitoring behaviour*, all the components proposed in her model are positively related to the trust factor. She did, however, conclude that monitoring behaviour may form the basis of trust where there is a high risk associated with trusting (Costa, 2003:617). As can be seen in the Figure below the model has been split into two parts, namely the antecedents of trust on top, and the components of team effectiveness below. One would note that the antecedents proposed by Costa (2003) strongly represent those proposed by Mayer *et al.* (1995).

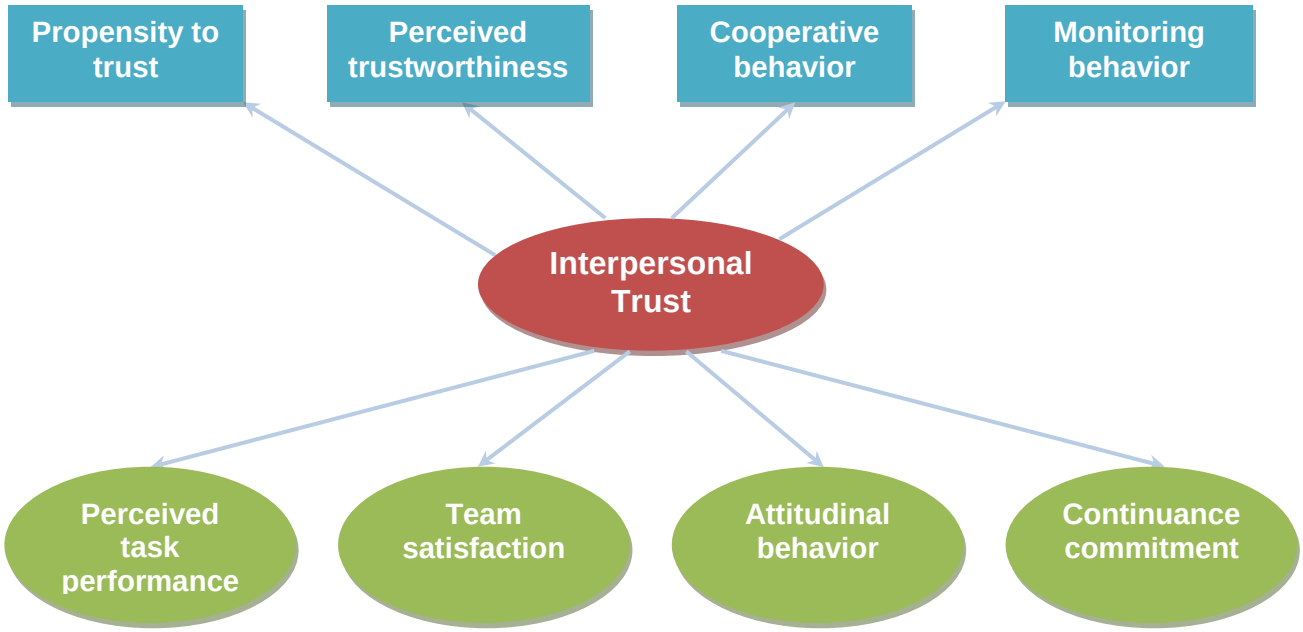


Figure 4: Co-worker trust model – Antecedents and outcomes
(Source: Costa, 2003:609)

The researcher suggests that the component *cooperative behaviour* is similar to the *reciprocal nature of trust* proposed in the conceptual model proposed in this research document (see Figure 2). The reason is that cooperative behaviour by its nature requires give and take from the participants in the relationship. The researcher proposes that the attitude and behaviours of the parties continuously change and are adjusted based on the observations on the give and take actions and responses of the party members. This in turn increases or decreases the levels of trust in the relationship.

Perceived task performance is the perception of team performance in relation to stated objectives and targets. As with trust, commitment has a cognitive and affective component. The affective component of commitment is attitudinal commitment. According to Allen and Meyer (1990:1) a*ttitudinal commitment* refers to an employee's emotional attachment to, identification with, and involvement in, the organisation. The cognitive component of commitment is continuance commitment. *Continuance commitment* reflects a membership based on economic reasons, that is the profits associated with continued participation in the organisation or the costs associated with leaving (Kanter,1968:504).

This brings me to my first hypothesis:

H1: Organisational innovativeness is positively correlated with the strength of lateral trust in an organisation

2.4.2 Vertical trust – Trust in leadership

Transformational leaders engender trust, seek to develop leadership in others, exhibit self sacrifice and serve as moral agents, focusing themselves and followers on objectives that transcend the more immediate needs of the work group. They transform followers by creating changes in their goals, values, needs, beliefs and aspirations. They accomplish this transformation by appealing to the follower's self-concepts, namely their values and personal identities (Kreiner & Kinicki, 2008:479 – 480). Figure 5 provides a model for transformational leadership.

The four practices of transformational leadership are charisma or idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Judge and Piccolo (2004:755) describe these as follows:

- *Charisma, or idealized influence.* This is the degree to which the leader behaves in admirable ways that cause followers to identify with the leader. Charismatic leaders display conviction, take stands, and appeal to followers on an emotional level.
- *Inspirational motivation.* It is the degree to which the leader articulates a vision that is appealing and inspiring to followers. Leaders with inspirational motivation challenge followers with high standards, communicate optimism about future goal attainment, and provide meaning for the task at hand.
- *Intellectual stimulation.* This is the degree to which the leader challenges assumptions, takes risks, and solicits followers' ideas. Leaders with this trait stimulate and encourage creativity in their followers.
- *Individualized consideration* is the degree to which the leader attends to each follower's needs, acts as a mentor or coach to the follower, and listens to the follower's concerns and needs.

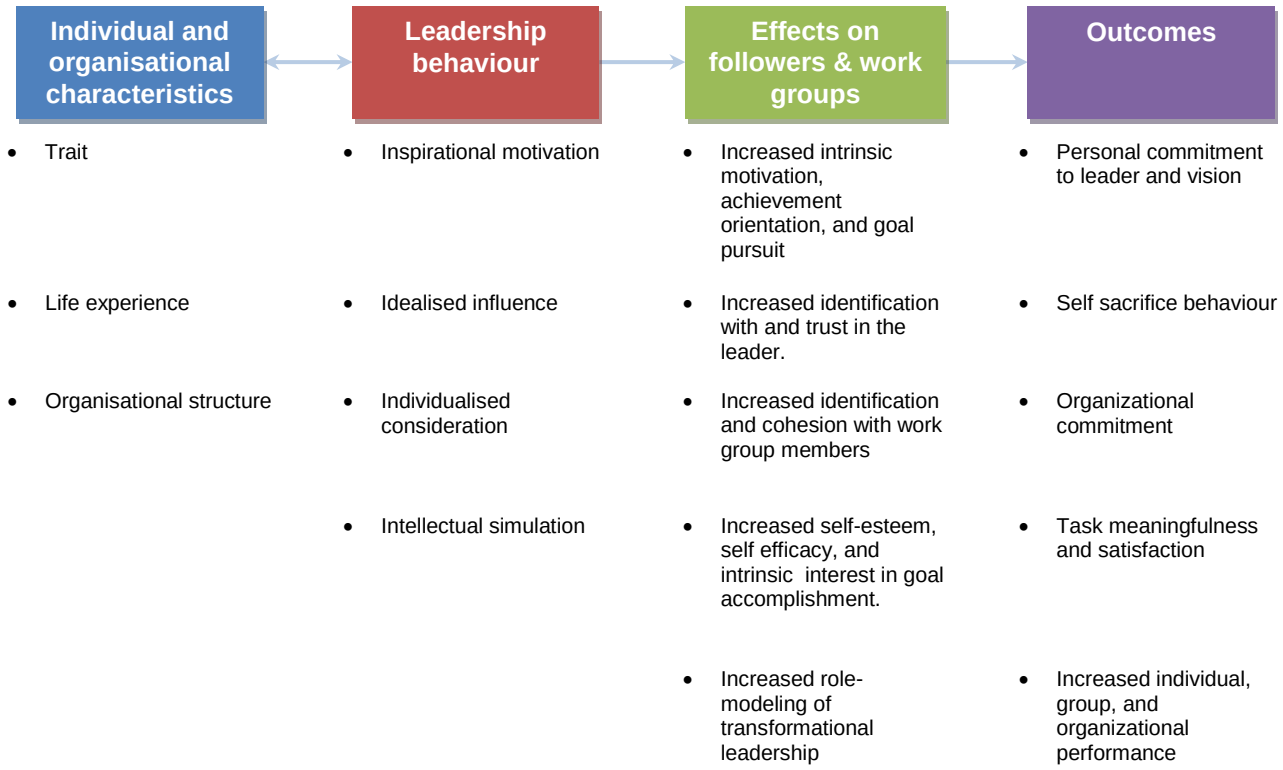


Figure 5: A transformational model of leadership

(Source: Kreiner & Kinicki, 2008:481)

Stretching over a period of time, several researchers have found positive correlations between the practices listed above and employee trust. However, an analysis of the individual practices and their effect on employee trust has yielded some interesting results. Podsakoff, MacKenzie, Moorman and Fetter (1990:135) have found that, although the aggregate effect of the leaders behaviour influences employee trust, *intellectual stimulation* has a negative effect on trust. They suggested that leaders who continually urge or exhort followers to search for new and better ways of doing things create ambiguity, conflict, or other forms of stress in the minds of those followers (*Posakoff et al.*, 1990:135).

In a similar vein, Den Hartog, Shippers and Koopman (2002:33) found a positive correlation between transformational leadership behaviours and interpersonal trust. However, as in the case of Podsakoff *et al.* (1990), they found that the relationship of some aspects of the behaviours (individualized consideration and charisma) is stronger than others (intellectual stimulation, vision).

Finally, Gillespie and Mann (2004:601) found that an active leadership style characterised by transformation leadership, is associated with team members' trust in their leaders. As with the researchers mentioned above, they found that some practices are more strongly

correlated with trust than others. They noted that, although *intellectual stimulation* is positively associated with trust, it is significantly weaker than that for the other transformational practices and trust. They surmised that highly educated people are intrinsically motivated by their work, and thus intellectual stimulation, while important, may be less crucial for establishing trust in their work setting (Gillespie & Mann, 2004:601).

Although a common sense approach to research would suggest that the four transformational leadership practices would have an effect on employee trust, the findings of some researchers do not support this hypothesis. In one case, Kraft, Engelbrecht and Theron (2004:16) endeavoured to determine whether there was a significant relationship between transformational leadership and trust. The findings of their research did not support their hypothesis or those of the researchers mentioned above.

In a second study conducted in a South African setting, Engelbrecht and Chamberlain (2005) were surprised to find no significant direct relationship between transformational leadership and trust in the leader. Engelbrecht and Chamberlain (2005:10) put forward the following reasons for their findings:

- The volatile economic conditions in South Africa create employee perceptions of insecurity and instability that are so powerful that they overrun the direct effect of leadership.
- The participants in the study were from large bureaucratic organisations in the banking industry. These organisations have tall organisational structures, and individuals are often not led by supervisors but by processes, structures and procedures, that function as substitutes for leaders.
- South African citizens are currently facing fierce competition in the labour market. Employees could perceive their leaders as possible obstacles to their career development, rather than facilitators of their growth.
- South African organisations are actively implementing affirmative action policies. It is possible that employees, therefore, may not be convinced that their leaders will act in their best interest and development of the employees.

This brings me to my second hypothesis:

> ***H2: Organisational innovativeness is positively correlated with the strength of vertical trust in an organisation.***

2.5 DIMENSIONS OF TRUST

2.5.1 Cognitive dimension

According to Lewis and Weigert (1995:970), trust is first based on a cognitive process. Individuals cognitively choose whom they will trust, based on what they take to be "good reasons", which constitute the evidence required to confirm trustworthiness. In other words, when trust has a cognitive basis, individuals look for a rational reason to trust another party (Erdem & Ozen, 2003:132).

In a similar vein, Rousseau *et al.* (1995:399) have argued that calculus-based trust is based on rational choice that is not only derived from the existence of deterrence, but also because of credible information regarding the intentions or competence of the trustor. This careful, methodical process involves the consideration of empirical evidence, and is not instantaneous; it develops only after the trustor is able to assess the available evidence (Morrow *et al.*, 2004:53).

Drawing on the work of McAllister (1995:28), three antecedents of cognitive-based trust are proposed:

- *The success of past interactions*. The personal nature of a working relationship, over an extended period of time, allows the trustor's to gauge the track record of the trustee when assessing the perceived levels of trustworthiness.
- *Social similarities between the trustor and trustee*. Groups of individuals with similar fundamental characteristics may have an advantage over diverse groups in their ability to create and maintain trusting work relationships.
- *Role specification and professional credentials*. Clearly defined roles and the presence of formal qualification, serve to increase the perceived trustworthiness of the trustee.

This brings me to my third hypothesis

> ***H3: Organisational innovativeness is positively correlated with the strength of cognitive-based trust in an organisation.***

2.5.2 Affective dimension

The emergence of the affective dimension begins when the trustor is willing to suspend the belief that the trustee may not be untrustworthy (Jones & George, 1998:536). Morrow *et al.* (2003:53) propose that this suspension takes place because of an absence of evidence to

cognitively evaluate. They argue that during this suspension, the parties rely on affective responses (e.g. instincts, intuition, feelings) to determine the trustworthiness of the trustee.

The affective dimension of trust exists when an emotional bond is created between the trustor and trustee in the relationship (Lewis & Weigert, 1995:971). From this point on, affective-based trust is underpinned by the fact that the perceived trustworthiness of the trustee is assured, based on the confidence created by repeated interactions which are backed up by empirical evidence (Jones & George, 1998:536-537).

McAllister proposes that the foundations for cognitive-based trust are external factors that make the behaviour of the relationship partners predictable. When considering affect-based trust, insights into the motive of the relationship partners provide the foundations for this dimension (McAllister, 1995:29). The antecedent of this dimension is personally chosen, rather than role prescribed, demonstrating care and concern, rather than self-interest. The antecedents may include altruistic behaviour and frequent social interaction (McAllister, 1995:29).

This brings me to my fourth hypothesis:

> ***H4: Organisational innovativeness is positively correlated with the strength of affective-based trust in an organisation.***

2.6 ORGANISATIONAL INNOVATIVENESS

As noted by many scholars, the rate of change in the modern business environment is ever increasing. Businesses that operate in this environment face continual renewal initiatives in order to adapt to these changes, or face extinction. One of the ways in which firms can renew themselves is to harness existing competencies and knowledge so as to find new and better ways of conducting business. The ultimate goal is to ensure that organisations sustain or improve on their competitive advantages. For this reason this part of my research focuses on innovation. As with interpersonal trust, the literature review is not meant to be exhaustive, but rather touches on the selected aspects of the organisational innovativeness topic.

2.6.1 Defining organisational innovativeness

Wang and Ahmed (2004:304) define organisational innovativeness as “an organisation’s overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behaviour and process”. Using this definition they go on to define five types of innovation that make up the

dimensions of organisational innovativeness. Table 3 is a summary of the dimensions and their corresponding definitions.

Table 3: Wang and Ahmed's dimensions of organisational innovativeness

Dimension	Definition
Product innovativeness	The novelty and meaningfulness of new products introduced at the market at a timely manner.
Market innovativeness	The newness of approaches that companies adopt to enter and exploit the targeted market.
Process innovativeness	The introduction of new production methods, new management approaches and new technologies that can be used to improve production and management processes.
Behavioural innovativeness	Behavioural innovativeness is demonstrated through individuals, teams and management (that) enable the formation of an innovative culture and the overall internal receptivity to new ideas and innovation.
Strategic innovativeness	An organisation's ability to manage ambitious organisational objectives, and identify a mismatch of these ambitions and the existing resources in order to stretch or leverage limited resources creatively.

(Source: Wang & Ahmed, 2004:304 - 305)

Wang and Ahmed (2004) go a long way towards developing the organisational innovativeness construct, however, they are the first to admit that their initial hypothesis was rejected. They chose to keep the five factors of organisational innovativeness while stating that additional research was required in order to refine the innovativeness construct. Ellonen *et al.* (2008:171) took up the challenge. Based on the results of their research, they proposed that the dimensions of product and market innovativeness be combined into one factor, called product innovativeness. In addition to this they suggested that there are four dimension of the organisational innovativeness construct namely product, behavioural, strategic and process innovativeness. These remaining dimensions will be used to measure organisational innovativeness in the research document.

2.6.2 Dimensions of innovation - exploratory and exploitative innovation

Based on the work of Benner and Tushman (2003: 242) innovation can be classified according to its proximity to the current technology trajectory, and its proximity to the existing customer/ market segment. Researchers agree that the innovation construct can be divided into two types of innovation, namely exploratory and exploitative innovations.

Exploratory innovation

Drawing on the research undertaken by Benner and Tushman (2003:243), exploratory innovations can be described as radical innovations, and are designed to meet the needs of emerging customers or markets. This type of innovation requires new knowledge and information. It will ultimately result in a fundamental change in the technological trajectory and associated organisational competencies.

Products that are designed for new customers are often disruptive to an organisation, and require a drastic departure from existing activities. These types of innovative activities usually fall within the ambit of the highly skille employees and/or service providers of an organisation, with the understanding that a certain level of capital outlay may be required. It is generally viewed as a process that an organisation undertakes to make radical changes to its products or services with the aim of improving its competitiveness or future sustainability.

The most extreme form of exploratory innovation is the introduction of a disruptive technology into the market place. This innovation is defined as a radically new scientific discovery, providing organisations with the capability and/or foundation for altering the business environment by destroying the value of the existing technical competencies, and in the process, creating new business markets (Christensen, 1997).

Exploitative innovation

Exploitative innovations are incremental innovations and are designed to meet the needs of existing customers and markets (Benner & Tushman, 2003:243). This type of innovation would typically be centred on how existing operations could make improvements to established products, operating units and services to increase the competitive nature of the business. The principle applied is based on using the existing resources, including the tacit knowledge of the workforce, to investigate and improve an identified area of a business's operations, ideally with minimal capital outlay. It is characterised by small changes in the technological trajectory.

2.6.3 Leadership style and behaviour

It has been consistently suggested that transformational leadership is a preferred style for inducing creativity and innovation through developing intellectually stimulating and inspiring followers to transcend their own self-interest for a higher collective purpose (Panuwatwanich, Stewart & Mohamed, 2008:410). Leaders who have a high degree of leader-member

exchange (LMX) will be able to encourage employees to take risks, and to challenge the status quo. Another key characteristic is the strong level of mutual trust and emotional support exhibited between members of high LMX relationships, resulting in high LMX members being granted a good degree of job autonomy, flexibility, and decision-making authority (Tierney, 1999:122).

Panuwatwanich *et al.* (2008:411) summarise the notion that leadership for innovation is characterised by the following fundamental behaviours:

- Create and communicate exciting visions for the future
- Set out and promote new ideas, techniques, or innovative approaches to solving problems
- Encourage members to develop their own ideas, and to support them
- Spend time mentoring members
- Engage members and encourage them to share resources throughout the entire work processes, and
- Consult with members when making decisions

2.6.4 Team environment

For work group innovation to take place, Anderson and West (1998: 236) propose that a proximal work group environment has to exist. They define a proximal work group as “a permanent or semi-permanent team to which individuals are assigned, whom they identify with, and whom they interact with regularly, in order to perform work-related tasks”. The diversity of the group will further enhance their innovative capabilities. Paulus (as quoted by West, 2002:362) suggested that the reason for this is that groups composed of people from different professional backgrounds, knowledge, skills and abilities, bring differing perspectives on the issues to the group.

Summarising the works of West (2002:369 - 377), the work team innovation is characterised by the following behaviours:

- *Clarify and ensure commitment to shared objectives.* This will enable a focused development of new ideas and, through strong goal commitment, create the persistence necessary for innovation implementation in the face of resistance from organisation members.

- *Actively participate in the decision-making process.* High participation results in less resistance to change, which increases the likelihood of innovations being implemented.
- *Manage conflicts effectively.* Task-related conflicts within a psychologically safe environment, and minority dissent in a participative environment, will lead to innovation by encouraging debate and consideration of alternative interpretations of information available, leading to integrated and creative solutions.
- *Support innovation activity.* Support for innovation is the expectation, approval, and practical support of attempts to introduce new and improved ways of doing things in the work environment (West, 1990 as quoted by West 2002:373).
- *Develop intra-group safety*. This refers to the sense of psychological or psychosocial safety group members feel in the presence of their fellow group members, and especially during whole group interactions. It includes the related concepts of group affective tone, safety climate, and conflict acceptance.
- *Be reflexive.* This is the extent to which team members collectively reflect upon the team's objectives, strategies and processes, as well as their wider organisations and environment, and adapt them accordingly (West, 1996 as quoted by West, 2002:376). The three central elements to the concept of reflexivity are reflection, planning and action or adaptation.
- *Integrate skills*. This enables the teams to respond to the requirements of the task and innovate by utilising, with maximum effort, their diverse skills, and responding to external demands by developing (in a safe, unthreatening group environment) creative ideas and implementing them as innovations.

There is very little research that has been conducted implicating co-worker trust in the innovation process. With this in mind, research conducted by Semercioöz, Hassan and Aldemir (2011:130) have found that co-work trust accounts for significant variances in strategic innovativeness.

2.7 LINKING TRUST AND INNOVATION

Dovey (2009:322 – 323), in the conclusion of his research into the role of trust in innovation, had the following to say with regards to trust and innovation:

> *Trust, as a key social capital resource, is indispensable to the creation of a social environment in which ideas are freely generated, honestly assessed and selected and collectively transformed into profitable new products and services. To create such a social environment, the multiple leaders within a stakeholder community must be very competent at building and maintaining trusting relationships within, and across, stakeholder groupings*

> *(staff, customers, suppliers, broader community and, in some cases, competitors). When this is achieved, ideas can be sourced easily from within, or beyond, stakeholder networks (networks with porous boundaries), and innovation strategy can be executed successfully with authentic commitment and passion.*

The research by Ellonen *et al.* (2008) has indicated that behavioural innovativeness, defined as: "the overall internal receptivity to new ideas and innovation that is demonstrated through individuals, teams and management and that enables the formation of an innovative culture" (Wang & Ahmed, 2004:305), could be enhanced by building both interpersonal and impersonal organisational trust (Ellonen *et al.,* 2008:176). In addition to this they found that vertical trust was critical in terms of offering support needed for the reception of new ideas and innovations.

Semerciöz, Hassan and Aldemir (2011:129) conducted research to determine the relationships between the dimensions of organisational trust in the shape of coworker trust, employees' trust on supervisors/leaders, and institutional trust with the dimensions of organisational innovativeness such as product, process, behavioral and strategic innovativeness. Their results indicate that the effects of institutional trust are stronger than those of other types of interpersonal trust in determining an organisation's innovativeness.

2.8 CONCLUSION

A central theme in both the trust and innovation construct is the willingness of the parties involved to take risks. The willingness to allow controlled and monitored risk-taking behaviour required for effective innovation initiatives exposes both parties to varying levels of vulnerability. The existence and strength of an emotional bond between both parties have a moderating effect on the feelings of vulnerability.

There is a higher likelihood of the formation of cognitive-based trust in temporary work groups. The reasons for this are as follows:

- The work group has a finite life-span. This means that once the group goals have been achieved, group interaction decreases and it more difficult to maintain the long-term personal relationship that is required for the formation of affective-based trust.
- The group is typically made up of members from different work disciplines. Therefore, trust is built on the perception of competency and professional credentials.
- Finally, temporary work groups usually have mile-stones that have to be met in order to achieve their goals. By achieving these milestones, the individuals in the group can access the intentions and competencies of the individual group members based on credible evidence, which is one of the aspects of cognitive-based trust

As the interaction between the two parties in a trust relationship yield favourable results, and positive expectations are met, the nature of the relationship moved from a cognitive-based trust to an affective-based trust. Figure 6 is a graphical representation of this shift. As can be seen in the Figure below, I propose that individuals have a higher propensity to risk taking behaviours once an affective-based trust relationship has been established.

Before managers can harness these trust relationships, to create that environment, they need to understand the impact that their behaviour, and those of their co-workers, has on interpersonal trust relationships. Ultimately managers and co-workers must be willing to take risks. Once risks are taken, innovative ideas can be generated and implemented in a business.

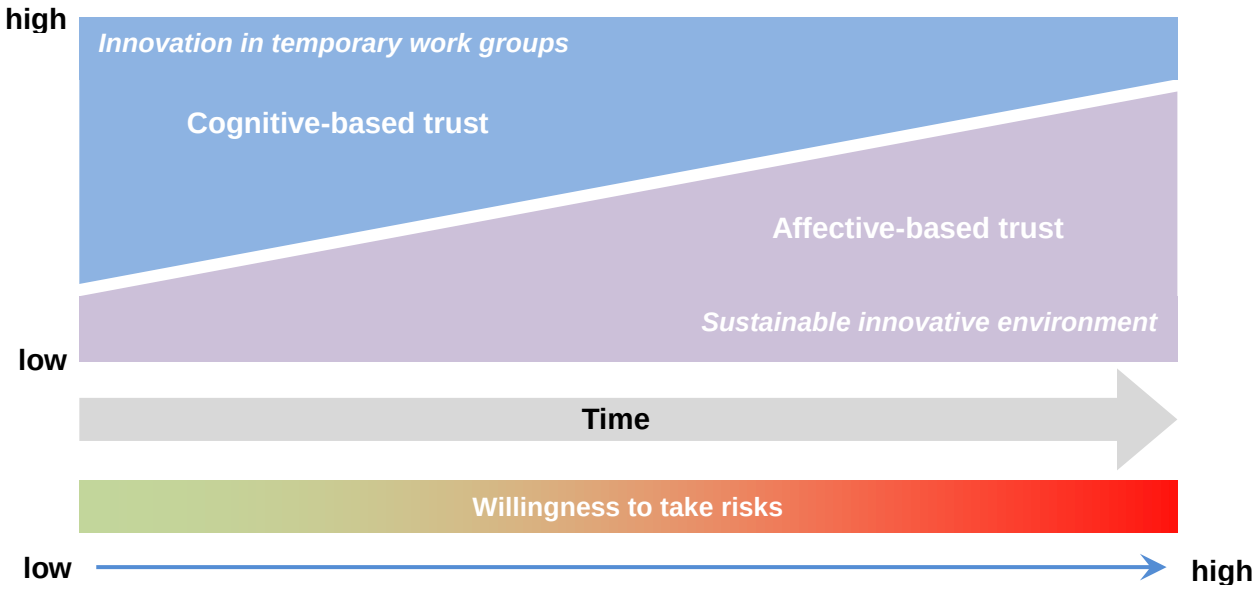


Figure 6: Cognitive- vs. Affective-based trust
(Source: Researcher)

Reaching this point is far more difficult that it sounds. From a manager's point of view, trusting employees to make changes to business processes means that they have to give up a certain level of control. This is made more difficult by the fact that they, themselves, are ultimately responsible for the success of their organisation. From a co-workers' perspective, the effective execution of these innovations requires individuals (and group) to make themselves vulnerable to each other; either to the rejection of their ideas (and associated embarrassment); the lack of recognition from others (through their ideas not being taken seriously); or revealing ignorance (tacitly or explicitly) (Dovey, 2009:313).

2.9 CHAPTER SUMMARY

One of the undeniable foundations for human relationships is trust. Although many definitions of trust exist, scholars agree that the definitions of Mayer *et al.* (1995) and Rousseau *et al*. (1998) more than adequately encompass what trust is. For this reason they are frequently used as definitions of trust in numerous research documents. The common components of their definitions are *the willingness to be vulnerable* and the creation of a *positive expectation*.

Mayer ***et al***'s model separates trust from trustworthiness, with three characteristics of the trustee (*ability, benevolence and integrity*) appearing as the antecedents of trust. In addition to this they drew a distinction between trust as a situational state and trust as a personality variable, with trust propensity, defined as a stable individual difference that affect the likelihood that a person will trust (Colquitt *et al.*, 2007:909). Drawing on later research, the importance of third *party influence* was highlighted and discussed in this review. The outcome of a trust relationship is the willingness of the trustor to take risk. In other works there is *risk taking in the relationship*.

Trust has four distinct dimensions. The first of these is a *cognitive dimension* where trust is based on a rational evaluation of the cost and benefits of entering into a trust relationship. The second dimension is the *affective dimension*. This dimension is highlighted by an emotional bond between the trustor and trustee in the relationship. In an organisational setting, interpersonal trust can either be vertical or horizontal. The third dimension is v*ertical trust* which is viewed as the trust between a manager/leader and subordinates. The final dimension is horizontal *trust* which is trust between co-workers. Obviously leadership styles will have an impact on the levels of trust. Only one type of leadership style was considered in this review, namely *transformational leadership*. Finally the literature survey includes a section that detail past research in which interpersonal trust has been linked to the creation of an innovative environment within an organisation.

The aim of the research is to determine whether there is a positive correlation between interpersonal trust and the creation of an innovative climate in an organisational setting. For this reason the concept of innovation, as an outcome of interpersonal trust, was expanded upon. *Innovation* was defined as "an organisation's overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behaviour and process". Five dimensions of innovativeness were defined which included *product, market, process, behavioural and strategic* innovativeness.

Two types of innovation were put forward in the review, namely exploitative and exploratory innovation. *Exploitative innovations* are incremental innovations and are designed to meet the needs of existing customers and markets where *exploratory innovations* are radical innovations and are designed to meet the needs of emerging customers or markets. They affect on the market place as well as the proximity of the technological trajectory were also discussed. Finally the creation of an innovative climate was discussed following a brief discussion of leadership styles and behaviours.

3 EMPIRICAL INVESTIGATION

3.1 INTRODUCTION

From the literature review in Chapter 2, a greater understanding has been gained into the trust and organisational innovativeness constructs. A review of prior research conducted with regards to these constructs suggests that there is a correlation between interpersonal trust and organisational innovativeness. This chapter focuses on the research methodology that was employed in order to achieve the research objective outline in section 1.4. The starting point of the empirical investigation is a high-level overview of the Chlor Alkali Business.

3.2 DISCUSSION OF THE CHLOR ALKALI BUSINESS

In 1964 African Explosives and Chemical Industries opened a fourth manufacturing site, the Midland Factory at Sasolburg. Using feedstock from SASOL, the new factory initially produced calcium cyanide (1964) and then polyethylene (1966). Organic peroxides, Caustic Soda/chlorine (from mercury and diaphragm cell technologies) PVC, CFC, and chlorinated solvents followed.

The company name was abbreviated to AE & CI in 1972, a further name change to AECI followed in 1976, and the company's dependence on coal as a raw material was emphasized with the commissioning of the Coalplex project at Sasolburg in 1978. A joint venture with Sentrachem, Coalplex consisted of five linked plants: carbide, acetylene, chlorine, VCM, and PVC. Coalplex also produced caustic soda and lime hydrate.

In 1993, AECI and SASOL agreed to the formation of a new company called Polifin, a company listed on the JSE. This joint venture produces monomers, polymers, chlor-alkali products, cyanide, and peroxides. Restructuring involved closing the costly carbide-acetylene route to VCM and using, instead, ethylene from SASOL. Adherence to the Montreal Protocol resulted in the phasing out of CFC manufacture in 1995 and shortly thereafter manufacture of the precursor feedstock: perchloroethylene/tetrachloromethane. Reliance on mercury cell technology also ceased during this period with the progressive introduction of membrane cell technologies.

In 1997 Sasol bought out AECI’s interests in Polifin, delisted the company and Polifin became Sasol Polymers, a division of Sasol Chemical Industries.

The formation of Polifin and subsequently Sasol Polymers enabled the vertical integration of ethylene as a feedstock into vinyl chloride monomer (VCM) and, by polymerization, into the thermoplastic: poly-vinyl chloride (PVC). Sasol Polymers has well-established routes to markets and has formed strong B2B relationships with converters and PVC is a ubiquitous polymer finding application in numerous industries which include, construction (pipe, electrical cable), packaging (transparent films, bottles and blister pack) medical (medical components such as syringe bodies, blood and intravenous bags).

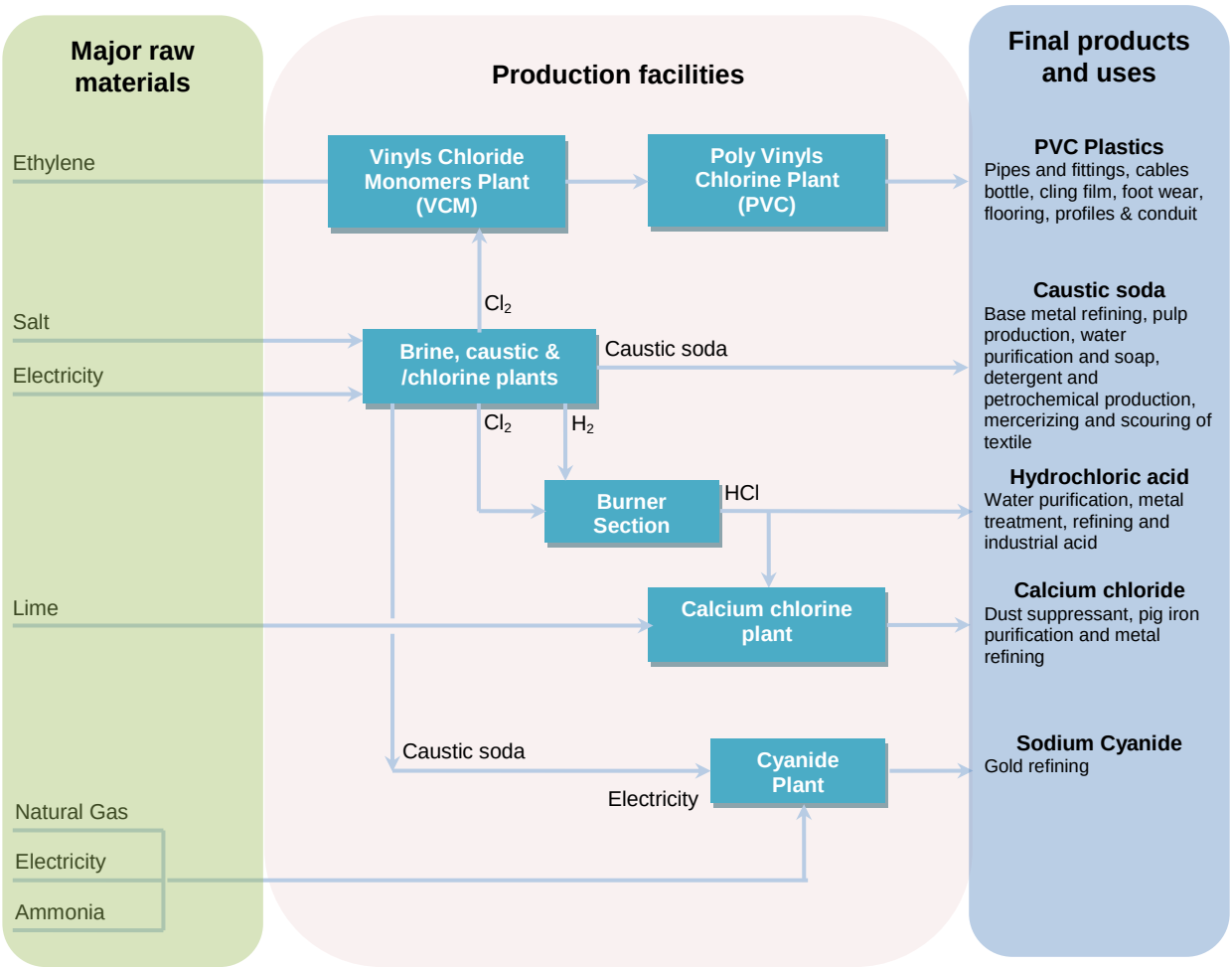


Figure 7: Chlor Vinyls Business raw materials, process overview and final product
(Source: Researcher)

Caustic soda finds application in a wide range of industries but the RSA market is atypical. Whereas most regional markets have a strong influence from the alumina and paper and pulp sectors, the RSA market does not feature alumina but does see a strong substitute sector in respect of base metal refining.

Cyanide finds application in the gold mining industry where it is irreplaceable. In recent years, following on the recession, gold has seen itself having safe haven status. Consequently the gold price, both in US$ and Rand terms, has seen unprecedented strength which has encouraged a resurgence in gold mining projects globally and slimes dam retreatment locally.

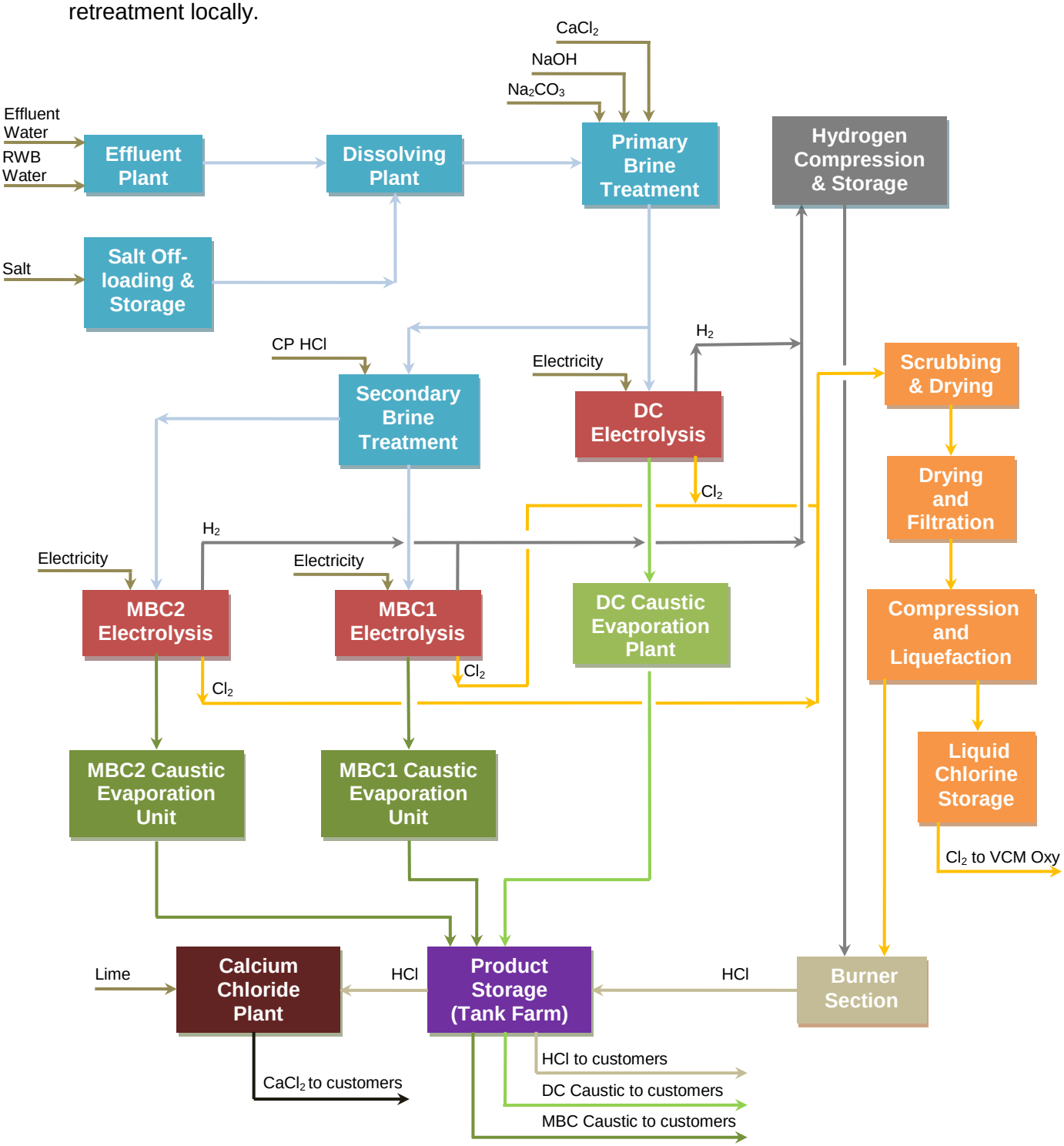


Figure 8: Chlor Alkali Business Process Overview.

(Source: Researcher)

The primary challenge facing Sasol Polymers is the issue of ageing production facilities which are not on a world scale. There are environmental concerns around chlorine chemistry; this includes a market perception that PVC is not easily recyclable, which is a fallacy. In recent years the market has also seen increasing competitive intensity from imports. However, a well established working relationship with convertors in RSA yields the opportunity to engage in market development in the SADC region as a clear imperative. The sub Saharan region is one of the lowest per capita users of PVC. The business remains the pre eminent ethylene consumer of choice in the ethylene value chain as well as within the Chlor vinyl value chain.

3.3 TARGET GROUP

The empirical study focused on the Chlor Alkali manufacturing facilities located at the Sasol Polymers, Midland site situated just south of Sasolburg, South Africa. When determining the target population, a decision was taken to use that portion of the workforce directly involved with the effective operation of the business assets. As such the population group was defined by their role in the business as it relates to the direct operation and maintenance of production units. Included in the population were those business unit support functions that are responsible for the initiation and implementation of maintenance and improvement projects. Thus, the total population size was determined to be 189 employees.

Table 4 shows the demographic information for the selected population group within the Chlor Alkali Business. The total demographic information is broken down into two groups, namely the leadership- and co-worker groups. Tables 5 and 6 give a breakdown of the demographic information of the groups.

Table 4: Population biographical information

Average Age	Average Years of Service	Ethnic Origin				Gender	
		White	African	Colored	Indian	Male	Female
43	17	67	120	0	2	180	9

(Source: Researcher)

Table 5: Population biographical information – Leadership group

Leadership Level	Average Age	Average Years of Service	Ethnic Origin				Gender	
			White	African	Colored	Indian	Male	Female
Manager of Businesses	49	23	1	1	0	0	2	0
Manager of Functions	39	20	2	1	0	0	3	0
Manager of Managers	46	21	3	1	0	1	5	0
Manager of Others	45	21	12	12	0	1	25	0
Total	**45**	**21**	**18**	**15**	**0**	**2**	**35**	**0**

(Source: Researcher)

Table 6: Population biographical information – Co-worker group

Groups	Average Age	Average Years of Service	Ethnic Origin				Gender	
			White	African	Colored	Indian	Male	Female
Technical Personnel	43	18	11	4	0	0	13	2
Discipline Specialists	42	18	12	1	0	0	9	4
Process Artisans/Operators	45	17	6	81	0	0	85	2
Maintenance Artisans	35	10	20	19	0	0	38	1
Total	**42**	**16**	**49**	**105**	**0**	**0**	**145**	**9**

(Source: Researcher)

3.4 SAMPLE SELECTION

Sampling can be broken up into two broad categories, namely probability and non-probability sampling. Using probability samples, each population member has a known chance of being included in the sample, and researchers can calculate confidence limits for sampling errors. With non-probability sampling confidence limits cannot be calculated (Kotler & Armstrong, 2009:140). For the purpose of this research non-probability convenience samples were taken.

In section 3.3 it was mentioned that the population group was defined by the roles they play in the organisation and comprised a group of 189 individuals. The questionnaire was sent out to the entire population in a hard copy and electronic format, in the form of emails. The individuals who responded formed the sample. The population was targeted not only because it was feasible (convenient) but because I wished to increase the validity of my findings. It would also allow me to generalise my findings to the defined population but would not necessarily mean the findings would be valid in general.

3.5 RESEARCH APPROACH

Different research methods can be used to achieve the objective of a research document. Two of the most commonly used methods are quantitative and qualitative research methods. Holloway (1997:2) describes qualitative research as follows:

> *Qualitative research is a form of social inquiry that focuses on the way people interpret and make sense of their experiences and the world in which they live. A number of different approaches exist within the wider framework of this type of research, but most of these have the same aim: to understand the social reality of individuals, groups and cultures. Researchers use qualitative approaches to explore the behaviour, perspectives and experiences of the people they study. The basis of qualitative research lies in the interpretive approach to social reality.*

According to Wayne (2009:1), quantitative research is a scientific investigation that includes both experiments and other systematic models that emphasize control and quantified measures of performance. Measurements and statistics are central to this type of research because they are the connections between the empirical observations and mathematical expressions of relations (Wayne, 2009:1).

Simply put, qualitative research deals with subjective data produced by the minds of the respondents or interviewees while the purpose of quantitative research is to evaluate objective data consisting of numbers (Welman, Kruger & Mitchell, 2010:8). There are several differences between qualitative and quantitative research methodologies. These have been summarised in table 7 below.

Table 7: Differences between quantitative & qualitative research methodologies

Quantitative	Qualitative
Uses a process of analysis that is based on complex structured methods to confirm or disprove hypotheses.	Based on flexible and explorative methods because it enables the researcher to change data progressively.
The purpose of quantitative research is not to deal directly with everyday life, but rather with an abstraction of reality.	Investigates the constraints of day-to-day events and base their results on the daily events and behaviour of people
Researchers try to understand the facts of the investigation from an outsider's perspective.	Researchers try to achieve an insider's view by talking to subjects or observing their behaviour in a subjective way.
Researchers try to keep the research process as stable as possible.	Researchers work with the dynamic and changeable nature of reality.
Researchers control the investigation and structure of the research situation in order to identify and isolate variable.	Researchers make use of a holistic approach, that is, they collect a wide array of data.
Researchers focus on reliability, that is, consistent and stable measurement of data as well as replicability.	Researchers focus on validity because the object of the study must be representative of what the researcher is investigating.
Quantitative research usually aims for larger numbers of cases and the analysis of results is usually based on statistical significance.	Qualitative research involves small samples of people studied by means of in-depth methods.

(Source: Welman *et al.*, 2010:8-9)

Having gained a better understanding of the approaches of and differences between qualitative and quantitative research methodologies, I selected a quantitative research approach as it was regarded as the most suitable option to gather quantifiable data to investigate the nature and strength of the correlation between the selected constructs of interpersonal trust and organisational innovativeness, should such correlations be found.

3.6 SURVEY INSTRUMENT

A questionnaire was used as the sole source of data collection for the research. There are a number of advantages and disadvantages to using questionnaires for data collection. Summarising Cummings and Worley (2009:124), the following advantages and disadvantages should be taken note of:

Advantages

- *Efficiency.* Questionnaires are one of the most efficient ways of collecting data.
- *Large samples.* Because they typically contain fixed response queries, they can be administered to large numbers of people simultaneously.
- *Quick analysis*. Questionnaires can be analysed quickly, thus permitting quantitative comparison and evaluation.
- *Easy feedback*. Feedback on the quantitative comparisons and evaluations is relatively easy.
- *Relatively inexpensive*. Questionnaires are relatively inexpensive to compile and administer to the target population.

Disadvantages

- *Limited responses.* Responses are limited to the questions asked in the instrument. They provide little opportunity to probe for additional data or to ask for points of clarification.
- *Impersonal.* Questionnaires tend to be impersonal and non-empathetic and respondents may not be willing to provide honest answers.
- *Response bias*. Questionnaires often elicit response biases, such as the tendency to answer questions in a socially acceptable manner.

The questionnaire consisted of 62 items in total. The first 5 items are questions relating to the demographical information of the respondents. The remaining items relate to the identified dimensions of interpersonal trust and organisational innovativeness and were

answered by means of a five point Likert scale to obtain the respondents views. The five-point Likert scale was divided into 1) as strongly disagree, 2) as disagree, 3) as neither agree or disagree, 4) as agree and 5) as strongly agree. The complete questionnaire is available in appendix A.

Cronbach's alpha coefficients are used to measure the internal consistency, and thus reliability, of the multi-item survey instrument employed in this research. Nunnally and Bernstein (1994:10) define Cronbach's alpha (α) as a measure of the relationship of all the items in a survey instrument and their ability to assess a single, underlying domain (construct). Although Nunnally and Berstein (1994:10) recommend alpha levels between 0.70 and 0.90, it is not uncommon for contemporary researchers to characterise reliabilities in the 0.60s and 0.70s as good or adequate (Clarke & Watson, 1995:315). In fact, Field (2009:675) notes that when dealing with psychological constructs, values below even 0.7 can, realistically, be expected because of the diversity of the constructs being measured. For the reasons given above, a Cronbach's alpha value of >0.6 is deemed acceptable for this reasearch paper.

Ellonen *et al*. (2008:167 – 168) was used to source a 30-item scale relating to *lateral and vertical trust*. Using the items compiled by Ellonen *et al.* (2008), both these types of trust can be measured within the dimensions of competence, benevolence and reliability. The fifteen item scales are used for both the lateral and vertical trust dimensions. A study of the items relating to the reliability dimensions (see Table 8) shows that, although dimension is named "reliability" many aspect and behaviours relating to the integrity aspect of Mayer *et al*'s (1995) model are covered. Therefore it is my belief that the use of these items suitably covers the integrity aspect of trustworthiness mentioned in Chapter two. The dimensions and items are presented in Table 8 below.

Table 8: Ellonen *et al.*'s dimension and items for vertical & lateral trust.

Dimension	Items
Reliability	The leaders/employees in this organisational unit have a strong sense of justice.
	The leaders/employees in this organisational unit try hard to be fair in dealings with others.
	The actions and behaviour of the leaders/employees in this organisational unit are always consistent
	Integrity is a key value in the operations of the leaders/employees of this organisational unit.
	In general, most leaders/employees in this operational unit keep their promises.
	The leaders/employees in this operational unit communicate openly about things that are important to me.
Competence	The leaders/employees in this operational unit have much knowledge on the work that needs to be done.
	The leaders/employees in this organisational unit are known to be successful in what they do.
	I feel very confident about the skills of the leaders/employees of the unit.
	I believe that most leaders/employees in this organisational unit do a very good job at their work.
	A large majority of the leaders/employees of this organisational unit are competent in their area of expertise.
Benevolence	The leaders/employees in this organisational unit is sincerely concerned with my welfare.
	My needs and desires are important to the leaders/employees of the organisational unit.
	A typical leader/employee in this organisational unit is sincerely concerned with the problems of others.
	Most of the times, the leaders/employees try to be helpful rather that just look out for themselves

(Source: Ellonen *et al*., 2008:168)

Table 9 summarises the findings of their measuring instrument's reliability based on the use of the Cronbach's alpha values. As noted in the table below all the alpha measurements range between 0.894 and 0.935 and are above the minimum stated levels and are thus are acceptable.

Table 9: Ellonen *et al.*'s item scale reliability for lateral and vertical trust

Dimension	Number of Items	Alpha (α)
Trust in employee reliability	Six items	0.894
Trust in employee competence	Five items	0.846
Trust in employee benevolence	Four items	0.859
Trust in leader's reliability	Six items	0.920
Trust in leaders' competence	Five items	0.935
Trust in leaders' benevolence	Four items	0.896

(Source: Ellonen *et al*., 2008:168)

An 11-item scale relating to *cognitive- and affective-based trust* was sourced from research conducted by Ferda and Ozen (2003:134). The six items relating to cognitive-based trust deal with how team members perceive each other's integrity, competence and ability. The five item relating to affective-based trust deal with how team members perceive others' demonstration of concern and benevolence Ferda and Ozen (2003:134). Table 10 describes the dimensions and items of cognitive and affective trust.

Table 10: Ferda and Ozen's dimension and items for cognitive and affective trust

Dimension	Items
Cognitive trust	Team members fulfil their undertaking successfully
	It cannot be said that team members have the necessary qualifications required for team performance (R).
	I trust in the expertise of team members
	Team members actions reflect his or her word
	Team members strive to be honest with each other
	If I make a mistake on this team, it is often held against me (R).
Affective trust	You do not easily want help from team members (R).
	Team members always share all the sources with each other.
	The team members encourage each other to introduce different ideas and suggestions.
	Team members respect each other's emotions and ideas.
	Team members can ask for help from each other with their personal problems.

(Source: Erdem & Ozen, 2003:134)

Note: (R) denotes a reverse question

Although Ferda and Ozen (2003) choose not to report the sub-scale alpha scores in their article, the reported Cronbach's alpha value of the overall instrument and scale was found to be high, which is above the minimum stated level and are therefore acceptable. As can be seen in Table 11, a Cronbach's alpha value of 0.8 was achieved for the combined affective- and cognitive-based item scale.

Table 11: Ferda and Ozens item scale reliability for cognitive and affective trust

Dimension	Number of Items	Alpha (α)
Cognitive trust	Six items	0.8
Affective trust	Five items	

(Source: Erdem & Ozen, 2003:133)

A 16-item scale relating to *organisational innovativeness* was sourced from research conducted by Ellonen *et al*. (2008:170). As mentioned before Wang and Ahmed's (2004) original factor solution for organisational innovativeness failed in their study. For this reason Ellonen *et al.* (2008:171) propose a four-factor solution where product and market innovativeness dimensions are combined into one. The dimensions and items are described in Table 12 hereafter.

Table 12: Ellonen *et al.*'s dimension and items for organisational innovativeness.

Dimension	Items
Product innovativeness	In new product and service introduction, this organisational unit is often first-to-market. (Product) The new product and services of this organisational unit are often perceived as very novel and innovative by customers (Product). During the past five years, this organisational unit has introduced more innovative products and services than its competitors (Product). The products and services of this organisational unit often beat competitors (Market). In new product and service introduction, this organisational is often at the cutting edge of technology (Market).
Behavioural innovativeness	Individuals who do things in a different way are accepted and tolerated in this unit (Behavioural) In this organisational unit, people are encouraged to think and behave in original and novel ways (Behavioural). In this organisational unit, people are willing to try new ways of doing things and seek unusual, novel solutions (Behavioural) One gets a lot of support from managers if one wants to try new ways of doing things (Behavioural). When a problem cannot be solved using conventional methods, people in this organisational unit invent new methods (Process)
Strategic innovativeness	Managers of this organisational unit are willing to take risks to seize and explore "chancy" growth opportunities (Strategic). The managers of this organisational unit constantly seek unusual, novel solutions through "idea men" (Strategic). In comparison with its competitors, this organisational unit's most recent product marketing program is revolutionary in the market (Market.).
Process innovativeness	This organisational unit improves its business processes constantly (Process) During the past five years, this organisational unit has developed many new management processes (Process) This organisational unit changes the production methods faster than its competitors (Process).

(Source: Ellonen *et al*., 2008:170)

Table 13 summarises the finding of their measuring instrument's reliability based on the use of the Cronbach's alpha values.

Table 13: Ellonen *et al.*'s item scale reliability for organisational innovativeness

Dimension	Number of Items	Alpha (α)
Product innovativeness	Five items	0.833
Behavioural innovativeness	Five items	0.825
Strategic innovativeness	Three items	0.712
Process innovativeness	Three items	0.557

(Source: Ellonen *et al*., 2008:171)

As can be seen in the table above all of the Cronbach's alpha values for the dimensions, with the exception of process innovativeness, range between 0.712 and 0.833 and are

above the minimum state level and therefore acceptable. With regards to the alpha measurement for the process innovativeness dimension, a figure of 0.557 is very close to the minimum stated level. For this reason the figure is deemed acceptable bearing in mind that the study falls within the realm of behavioural sciences and as mentioned before alpha values below 0.7 can reasonably be expected.

The full questionnaire is detailed in Appendix A.

3.7 ETHICAL CONSIDERATIONS

Welman *et al*. (2010:201) have listed a number of ethical considerations that any researcher should be aware of prior to undertaking any form of research. The researcher should obtain the *necessary permission* from the respondents after they have been thoroughly and truthfully informed about the purpose of the investigation. The respondents should be informed of their *right to privacy,* for example they should be informed that the identity of the respondents will remain anonymous. The respondents should be given the assurance that they will be indemnified against any physical and emotional harm.

Cummings and Worley (2009:62 – 63) have identified two additional ethical considerations, namely the misuse of data and coercion. The misuse of data occurs when the information gathered is used punitively. Coercion occurs when the organisation's members are forced to participate in a study. The respondents should have the freedom to choose whether to participate in the study or not.

This completion of the body of work is subject to the granting of approval from an ethical committee. The members of the committee were satisfied that the research was conducted in line with the above mentioned ethical considerations and that the researcher adhered to high ethical standards throughout the entire research process.

3.8 CONCLUSION

It became apparent that the business, as the starting point of the PVC value chain, would benefit greatly from an innovative environment. The reason for this is that the business is responsible for the production of many of the raw materials used for the production of PVC. Failure of this business to operate optimally would have a detrimental impact on the efficiency and availability of the downstream manufacturing plants. The business itself is a consumer of expensive raw materials and utilities, such as electricity and steam, and having an efficient operation would go a long way to controlling the manufacturing costs.

The decision to define the population in terms of the roles they play relating to the operation, maintenance and project environment of the business assets yielded a total population of 189 individuals. The population can be divided into two groups, namely the leadership group and co-worker group. The items which were used to measure the identified dimensions of trust and organisational innovativeness were sourced from standardised questionnaires and sent out to the entire population, where the people who responded formed a non-probability convenience sample. The impact of this decision will be discussed in greater detail in Chapter four.

The Cronbach's alpha coefficient was used to confirm the internal consistency of the various sub-constructs in the original studies. A Cronbach's alpha value of >0.6 was deemed acceptable for this reasearch paper. All the dimensions, with the exception of process innovativeness, scored above the 0.6 threshold that in the source articles was deemed acceptable. In terms of the process innovativeness dimension an alpha value of 0.557 was thought to be close enough to the 0.6 marked to be acceptable.

3.9 CHAPTER SUMMARY

The starting point of the empirical investigation is to demarcate the physical location of the study. For the purposes of this investigation, the Chlor Alkali Business was chosen as the site for an investigation into the relationship between selected dimensions of interpersonal trust and organisational innovativeness. To gain a better understanding of the environment, a brief overview of the business was given.

Once this was done, the target population was demarcated. The population was defined in terms of the roles the individuals play in the business as they relate to the operation and maintenance of business assets. Included in the population were those support functions that have the responsibility for the initiation and implementation of business improvement projects. The total identified population comprised of 189 individuals broken up into co-worker and leadership groups.

For the purpose of the research a *non-probability convenience sample* was taken. The questionnaires were sent to the entire targeted population in a hard copy and electrical format, in the form of emails. The people who responded formed the sample. In this research I chose to use a quantitative approach, using questionnaires as the sole source of data collection. The *advantages, disadvantages and ethical considerations* of this decision were presented as well.

The questionnaire consists of 62 items. The first five items were used to gather the demographic information of the respondents. The remaining items relate to the identified dimensions of interpersonal trust and organisational innovativeness and were answered by means of a five-point Likert scale to obtain the respondents views. The *Cronbach's alpha coefficient* was used to measure the *internal consistency*, and thus *reliabilit*y, of the multi-item survey instrument. A Cronbach's alpha result of greater than 0.6 was deemed to be acceptable. The items for the questionnaire were sourced from two research documents. Prior to administering the questionnaire, research was conducted into the reliability of the survey instrument as found in the original studies.

The 30-item scale relating to *lateral* (15-items) and *vertical trust* (15-items) was sourced from the works of Ellonen *et al*. (2008). These types of trust were measured within the dimensions of *competence, benevolence and reliability*. The Cronbach's alpha values for these scales ranged between 0.894 and 0.935 and were above the minimum stated level.

The 11-item scale used to measure *cognitive- and affective-based trust* was sourced from Ferda and Ozen (2003). The six item scale relating to cognitive based trust dealt with how team members perceived their *integrity, competence* and *ability.* The five item scale relating to affective based trust dealt with how members' perceived others demonstration of *concern and benevolence*. The Cronbach's alpha value for the complete 11-items sale was 0.800 and thus above the minimum stated level.

A 16-item scale relating to *organisational innovativeness* was sourced from research conducted by Ellonen *et al*. (2008:170). The five dimensions of organisational innovativeness were measured using a four factor solution to measure *product* (5-items), *behavioural* (5-items), *strategic* (3-items) and *process innovativeness* (3-items). The product and market innovativeness dimension were combined into one construct. A detailed discussion of the empirical results will be given in Chapter 4.

4 EMPIRICAL RESULTS

4.1 INTRODUCTION

In Chapter three a basic overview of the Chlor Alkali Business was given. I then proceeded to discuss in detail what methodology was employed to conduct this research. The items which were used to measure the identified dimensions of trust and organisational innovativeness were sourced from standardised questionnaires and administered to the target population using non-probability convenience sampling. Ellis and Steyn (2003:51) have this to say about the selected sampling technique:

> *In some cases data obtained from convenience sampling are erroneously analysed as if it were obtained by random sampling. This data should be considered as small populations for which statistical inference and p-values are not relevant. Statistical inference draws conclusions about the population from which a random sample was drawn, using the descriptive measures that have been calculated. Instead of only reporting descriptive statistics in these cases, effect sizes can be determined. Practical significance can be understood as a large enough difference to have an effect in practice.*

Therefore I will report p-values for the sake of completeness. However, interpretation of the data is based on effect sizes and conclusions are applied to the sample group and not the entire population as is the case with random sampling. The analysis of the data was conducted using SPSS (2009) and STATISTICA (2011) and the findings of the analysis are presented and discussed in this chapter.

4.2 DEMOGRAPHICS

The number of employees in the demarcated population is 189. Over a period of ten days a total of 95 respondents completed the questionnaire resulting in a response rate of 52.3%. *Section A* consists of five items relating to the *biographical information* of the respondents. An analysis of the demographic information of the respondents suggests that the makeup of the sample mirrors the target population to a large extent. Appendix B comprises a graphical representation of the demographic information for the respondents versus the target population. Included in the graphs is an indication of the number of missing values for the 5-items relating to the sample demographics

An analysis of the completed questionnaires indicated that the layout of Question Five (i.e. to which Sasol group do you belong?) created some confusion among the respondents. Sixteen respondents marked two options to the question and one respondent did not complete the question at all. A possible explanation for the erroneous responses is the fact

that the individuals belonging to the leadership groups may have wished to indicate what co-worker group they manage.

The decision was taken, in consultation with the NWU statistical consultant, to consider the responses to Question Five where two options were marked as missing values. In other words, such respondents were assigned a missing response to question five, which resulted in 17 missing values for this particular question. This resulted in a small group indicated as managers (i.e. only eight) and, as such, analysis for the leadership group should be interpreted with great caution. It is important to remember that the remainder of the questions in the questionnaire were not affected by the assignment of missing values to question five.

4.3 RELIABILITIES FOR AGGREGATED DIMENSION SCORES

Cronbach's alpha coefficients and mean inter-item correlations were used to determine the reliability of the questionnaire. "Interrelated items may be summed to obtain an overall score for each participant. Cronbach's alpha coefficient estimates the reliability of the scale by determining the internal consistency of the test or the average correlation of items within the test" (SAS Institute Inc., 2005:295). As discussed before, a Cronbach's alpha value of >0.6 was deemed acceptable for this reasearch paper.

As an additional measure of the reliability, the mean inter-item correlations were calculated for each construct. This is calculated as the correlation of the individual items with the total score of the combined items measuring a selected construct. According to Clark and Watson (1995:316), when a broader higher order construct is measured and mean inter-item correlation as low as 0.15 – 0.20 is probably desirable; by contrast, for a valid measure of a narrower construct a higher mean inter-item correlation (0.40 – 0.50) is needed. The dimensions measured in this research could be considered as higher order constructs and therefore, for the purposes of this research, mean inter-item correlation values of >0.2 are deemed acceptable. A discussion of the scale reliability measurements follows below.

Section B consists of a 30-item scale relating to the dimensions of *reliability, competence and benevolence* associated with horizontal and vertical trust. Table 15 summarises the scale reliability scores of this section of the administered questionnaire. An analysis of the tables reveals that all the mean inter-item correlations for this construct are above the 0.2 mark and are therefore acceptable. As for the Cronbach's alpha results, all of the dimensions have alpha scores that range between 0.824 and 0.959. The dimensions exceed the 0.6 threshold and are therefore acceptable.

As can be seen in Table 15, the Cronbach's alpha values of four of the dimensions measured exceeded the 0.9 mark. Steiner (2003:102) noted that Cronbach's alpha measures not only the homogeneity of the items but also the homogeneity of what is being assessed. He concluded that alpha levels of 0.9 and above most likely indicate unnecessary redundancy (of the items) rather than a desirable level of internal consistency. While this may be the case, as mentioned before standardised questionnaires were used for this research and therefore they were administered unaltered to the target population. Additional research may be required to investigate whether redundancy is an issue or not.

Table 14: Scale reliability for horizontal and vertical trust aggregated dimension scores

Dimensions	Number of items	Item codes	Cronbach's alpha (α)	Mean inter-item correlation
Trust in employee reliability	Six items	Lt01 – LT06	0.840	0.465
Trust in employee competence	Five items	LT07 – LT12	0.844	0.602
Trust in employee benevolence	Four items	LT13 – LT16	0.824	0.544
Overall co-worker trust			0.932	0.477
Trust in leader's reliability	Six items	VT01 – VT06	0.917	0.647
Trust in leader's competence	Five items	VT07 – VT12	0.910	0.672
Trust in leader's benevolence	Four items	VT13 – VT16	0.892	0.677
Overall leaders trust			0.959	0.612

(Source: Researcher)

Section C consists of an 11-item scale relating to *cognitive and affective-based* trust. As mentioned before the six items relating to cognitive-based trust relate to how team members perceive their integrity, competence and ability. The five items relating to affective-based trust deals with how team members perceive other's demonstrations of concern and benevolence (Ferda & Ozen, 2003:134). Table 16 summarises the scale reliability scores for this section of the questionnaire.

The Cronbach's alpha results for this section of the questionnaire range between 0.633 and 0.729 which are above the 0.6 mark and are therefore acceptable. An analysis of the results summarised in the table below shows that the cognitive trust construct has a mean inter-item correlation value of 0.234 which is lower than the affective trust construct. An inter-item analysis of the results indicates that the low scores are related to the reverse question CT02 (see Appendix D). It appears as if the phrasing of the question may be poorly constructed possibly creating confusion among the respondents. However, because a standardised questionnaire was used, the decision was taken to keep question CT02 in the analysis. Further exploration of the scale and in particular CT02 may be needed in future research.

Table 15: Scale reliability for cognitive and affective trust aggregated dimension scores

Dimensions	Number of items	Item codes	Cronbach's alpha (α)	Mean inter-item correlation
Cognitive trust	Six items	CT01 – CT06	0.633	0.234
Affective trust	Five items	AF01 – AF05	0.729	0.349
Cognitive & affective trust			0.809	0.280

(Source: Researcher)

Section D consists of a 16-item scale relating to *organisational innovativeness*. The 16 items scale relates to how leaders and co-workers perceive an organisation and demonstrated behaviours relating to the dimensions of product, behavioural, strategic and process innovativeness. Table 17 summarises the reliability scores for organisational innovativeness. As can be seen in the table below the mean inter-item correlations for all the dimensions exceed the 0.2 threshold and are therefore acceptable. The Cronbach's alpha results exceed the 0.6 threshold and are therefore acceptable.

Table 16: Scale reliability for organisational innovativeness aggregated dimension scores

Dimensions	Number of items	Item codes	Cronbach's alpha (α)	Mean inter-item correlation
Product innovativeness	Five items	IN01 – IN05	0.868	0.568
Behavioural innovativeness	Five items	IN06 – IN10	0.844	0.520
Strategic innovativeness	Three items	IN11 – IN13	0.806	0.593
Process innovativeness	Three items	IN14 – IN16	0.800	0.573
Overall organisational innovativeness			0.933	0.470

(Source: Researcher)

As mentioned previously in this section the Cronbach's alpha coefficient estimates the reliability of the scale by determining the internal consistency of the test or the average correlation of items within the test (SAS Institute Inc., 2005:295). With Cronbach's alpha values exceeding the accepted limit of greater than 0.6 for all the dimensions, it is possible to calculate the aggregated scores for each dimension. This will be undertaken in the next section.

4.4 DESCRIPTIVE STATISTICS FOR AGGREGATED DIMENSION SCORES

In section 4.3 the reliability of the survey instrument was discussed and, based on acceptable criteria, deemed reliable. This allows me to use aggregated dimension scores for comparisons of the constructs based on demographic variables and correlations between constructs.

For the purposes of this research the mean and standard deviation will be used as descriptive measures for the data received from the respondents. Table 14 summarises the mean and standard deviations for the aggregated dimension scores. The arithmetic mean (typically referred to at the mean) is the most common measure of central tendency and serves as a "balance point" in a set of data. It is calculated by adding together all the values of a data set then dividing that sum by the number of values in the data set (Levine, Stephan, Krehbiel & Berenson, 2008:97).

Variability refers to the range of distribution around the mean. Two commonly used measures of variation that take into account how all the values in the data are distributed are the variance and standard deviation (Levine *et al*., 2008:106). The standard deviation is a measure of the spread of scores about the mean where the larger the spread, the further the scores are spread from the mean (Welman *et al.,* 2010:233).

Table 17: Descriptive statistics for the aggregated dimension scores

Dimensions	Mean	Standard deviation
Overall co-worker trust	3.28	0.693
Trust in employee reliability	3.22	0.719
Trust in employee competence	3.45	0.796
Trust in employee benevolence	3.14	0.788
Overall leaders trust	3.22	0.782
Trust in leader's reliability	3.12	0.868
Trust in leader's competence	3.41	0.768
Trust in leader's benevolence	3.13	0.878
Cognitive trust	3.31	0.517
Affective trust	3.31	0.681
Cognitive and affective trust	3.31	0.538
Overall organisational innovativeness	3.22	0.633
Product innovativeness	3.17	0.689
Behavioural innovativeness	3.22	0.755
Strategic innovativeness	3.10	0.759
Process innovativeness	3.41	0.750

(Source: Researcher)

A study of the table above highlights the fact that across all the identified dimensions, i.e. lateral, vertical trust, cognitive- and affective-based trust and organisational innovativeness, the mean scores range between 3.22 and 3.31. As mentioned before, some of the questions were answered by means of a five-point Likert scale with the scale divided into 1) as strongly disagree, 2) as disagree, 3) as neither agree or disagree, 4) as agree and 5) as strongly agree. The mean scores obtained indicate that, across the dimensions, the respondents are

only moderately positive about interpersonal trust and organisational innovativeness in the Chlor Alkali business.

The benevolence construct of the co-worker and leader groups had mean scores of 3.14 and 3.13 respectively which are relatively low in comparison with the other dimensions. This construct deals with the perception of “caring” in a trust relationship. One can conclude that both the leadership and co-worker groups work in an environment where they experience a perception of low levels of “caring” within the business. As noted in Chapter two, the benevolences sub-construct is one of the three dimensions that make up the trustworthiness construct in Mayer *et* al.’s (1995) model of trust. Creating the need for both groups to adjust their behaviours to reflect a more caring working environment will improve the perceptions of benevolence in the business, thus increase the levels of trust.

It is interesting to note that the mean scores for the product- and strategic innovativeness construct are relatively low as well. They scored 3.17 and 3.10 respectively. Product innovativeness is related to the novel and meaningful introduction of new products into the marketplace while strategic innovativeness is related to the management of organisational objectives and the resources that is required to meet them. In hind sight, these results were to be expected. A possible explanation for this is the fact that in an organisation the size of Sasol, it is exceptionally difficult to change the product offering of any given business unit. In terms of the business strategy, this is largely determined by individuals at senior levels in the organisations. For this reason, it may be conceivable that the respondents feel that they don’t possess the ability to influence the product offering of the business or strategic direction the business chooses to take.

Finally, the process innovativeness sub-dimension achieved a mean score of 3.41, which along with the leaders competency sub-dimension, is the highest of the mean scores. Process innovativeness is related to the introduction of new production methods and technologies which are used to improve production and management processes. A substantial proportion of MIT interventions are aimed at improving the throughput and efficiencies of production units. This score would indicate that, of all the sub-dimensions, the respondents are the most positive about their ability to manage and change the production process.

4.5 CORRELATIONS FOR AGGREGATED DIMENSION SCORES

Due to concerns about normality, Spearman’s rank order correlations were calculated to determine the nature and strength of the correlations between the identified dimensions of

trust and organisational innovativeness. The correlation coefficient is a standardized measure of an observed effect and is a commonly used measure of the size of an effect. Values of ±0.1 represent a small effect, ±0.3 is a medium effect and ±0.5 is a large effect (Field, 2009:170). A positive value (+) indicates a positive correlation between two variables while a negative value (-) indicates a negative correlation between two variables.

Correlations alone cannot prove that there is a causation effect, that is, that the change in the value of one variable is caused the change in the other variable. A large correlation can be produced simply by chance, by the effect of a third variable not considered in the calculation of the correlation or by a cause-and-effect relationship (Levine *et al*., 2008:130). Having taken note of this, a discussion of the correlations between the identified dimensions of interpersonal trust and organisational innovativeness follows. A summary of the findings are given in Table 23 (Appendix F). Figure 9 is a graphical representation of the four hypothesis tested in this research.

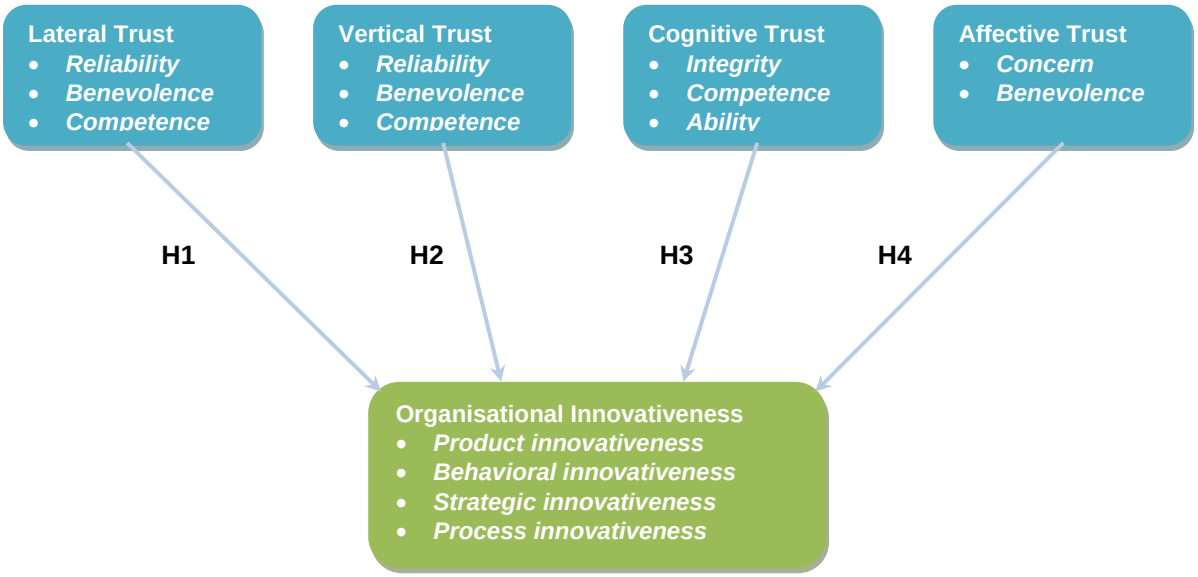


Figure 9: Graphical representation of research hypothesis.

(Source: Researcher)

The first hypothesis presented in this research was that organisational innovativeness is positively correlated with the strength of lateral trust in an organisation. With a correlation coefficient of 0.679 between overall lateral trust and overall organisational innovativeness one can conclude that there is a practically significant positive correlation between these two constructs. Thus the first research hypothesis is supported. Correlation coefficient values for overall lateral trust and the four dimensions of organisational innovativeness range between 0.516 and 0.672 indicating a practically significant positive relationship between these variables as well. These findings are in contrast to those of Ellonen *et al*. (2008) who found

none of the dimensions of organisational innovativeness were significantly related to lateral trust (Ellonen *et al*., 2008:173).

The second hypothesis presented in this research was that organisational innovativeness is positively correlated to the strength of vertical trust in an organisation. With a correlation coefficient of 0.717 between overall vertical trust and overall organisational innovativeness one can conclude that there is a practically significant positive correlation between these two constructs. Thus the second research hypothesis is supported. Correlation coefficient values for overall vertical trust and the four dimensions of organisational innovativeness range between 0.602 and 0.641 indicating a practically significant positive relationship between these variables as well. A possible explanation of this relationship is the fact that new ideas and innovation demand risk-taking rather than risk avoidance from employees and leaders (Ellonen *et al*., 2008:176). As has been noted, the outcome of a trusting relationship is the willingness of the parties in the relationship to take risks which I would suggest is a necessary ingredient for organisational innovation to take place.

When comparing the correlation between organisational innovativeness and lateral trust with the correlation between organisational innovativeness and vertical trust, it is interesting to note that the respondents demonstrated that the correlation between vertical trust and organisational innovativeness ($r = 0.717$) is higher than that of lateral trust and organisational innovativeness ($r = 0.679$). A possible explanation for this is the fact that innovation within a business requires resources in various forms, be it funds, human capital, time or support or a combination of all of these. Within a modern organisation, the leadership level holds the keys to unlocking these resources.

The third hypothesis presented in this research was that organisational innovativeness is positively correlated to the strength of cognitive-based trust in an organisation. With a correlation coefficient between the overall cognitive-based trust and overall organisational innovativeness of 0.580 one can conclude that there is a practically significant positive correlation between these two constructs. Thus the third research hypothesis is supported. Correlation coefficient values for overall cognitive-based trust and the four dimensions of organisational innovativeness range between 0.488 and 0.535 indicating a significant positive linear relationship between these variables as well.

The final hypothesis presented in this research was that organisational innovativeness is positively correlated to the strength of affective-based in an organisation. With a correlation coefficient value of 0.619 between overall affective-based trust and overall organisational innovativeness one can conclude that there is a practically significant positive correlation

between these two constructs. Thus the fourth research hypothesis is supported. Interestingly enough, when considering the dimensions of organisational innovativeness, the correlation coefficients between strategic and process innovation and affective-based trust are 0.461 and 0.463 respectively. This indicates a medium to high positive correlation between these two dimensions of organisational innovativeness and the affective-based trust construct.

The slightly lower correlations of strategic innovativeness and affective-based trust (r = 0.461) as well as process innovativeness and affective-based trust (r = 0.463) is interesting to note. The lower correlations of process innovativeness and affective-based trust could possibly be explained by the fact that any changes made to a production process are undertaken by following a highly structured management of change process. The structure of the process clearly defines the roles and responsibilities of the parties involved in the change which means that trust based on an emotional connection would not feature as significantly when making changes to the production process.

As far as strategic innovativeness goes, the overall business objectives and strategies are formulated by the business team leadership. This means that individuals working at the lower management and artisan levels have minimal input into the formulation of business strategies. In this scenario, it is feasible that trust based on an emotional connection between the parties involved does not feature as significantly when making changes to or implementing a business' long term strategy.

4.6 COMPARISONS FOR LEADERS AND CO-WORKERS ON ALL DIMENSIONS

Independent t-tests were conducted to compare the differences in responses between the co-worker and leadership groups. As noted earlier in the chapter, non-probability convenience sampling was applied in the research. The implication of this is that that the data gathered should be considered as small populations for which statistical inferences and p-values are not relevant (Ellis & Steyn, 2003:51). P-values will be reported for completeness but the conclusions made in this research will be based on effect size and should focus on the practical significance of the results as applied to the sample group and not the populations in its entirety.

For this reason, the parametric effect size was calculated and the comparisons made in this section will be undertaken using Cohen's d-values. In accordance with the guideline given by Ellis & Steyn (2003:52), the d-values will be interpreted as follows:

d ≈ 0.2 - Small effect; no practically significant difference.
d ≈ 0.5 - Medium effect; practically visible difference.
d ≈ 0.8 - Large effect; practically significant difference.

An additional concern is the fact that the sample of business leaders is very small (N=8) and it is not advisable to do a t-test, which is a parametric test, since the assumption of normality may not be met. Therefore a non-parametric test; was also conducted, namely the Mann-Whitney test. P-values for the Mann-Whitney test will be given for completeness but the corresponding non-parametric effect size will be used to substantiate the comparisons of the identified dimensions of interpersonal trust and organisational innovativeness between the co-work group and the leadership group.

According to Ellis and Steyn, 2003:52 statistically meaningful differences would be indicated by p-values of less than 0.05 (which is not relevant for this study, since the sample was not random), while the non-parametric effect sizes are defined as; 0.1 small, 0.3 medium, and 0.5 large. The guideline for interpreting these values is as follows:

p ≈ 0.1 - Small effect; no practically significant difference.
p ≈ 0.3 - Medium effect; practically visible difference.
p ≈ 0.5 - Large effect; practically significant difference.

Table 26 (Appendix G) is a summary of the descriptive statistics, independent t-test's p-values, Cohen's d-values and the p-values of the Mann-Whitney test and the corresponding non-parametric effect sizes.

4.6.1 Comparison of overall co-worker trust

The mean values for the leadership and co-worker groups are 3.39 and 3.31 respectively. The d-values yielded a value of 0.120 which indicates that the difference is practically negligible. This finding is confirmed in the non-parametric effect size of 0.047. In other words, no practically significant difference could be determined between the mean scores of the two groups. This indicates that both these groups have very similar views of co-worker trust within the business.

4.6.2 Comparison of overall leadership trust

The mean values for the leadership and co-worker groups are 3.48 and 3.22 respectively. A Cohen's d-value of 0.321 was obtained and a non-parametric effect size of 0.119. These values would suggest that there is a small effect and no practically visible difference

between the mean scores of these two groups. As with the comparisons on the overall co-workers trust, these results suggest that both the co-worker and leadership groups have very similar views on leadership trust within the business.

4.6.3 Comparison of cognitive-based trust

The means scores for this dimension for the leadership group and co-worker group are 3.56 and 3.32 respectively. The parametric effect size (d-value) and non-parametric effect size has resulted in values of 0.489 and 0.149 respectively. It can therefore be deduced that there is a medium effect and thus a practically visible difference in the means scores. This finding is interesting. It would suggest that the leadership group within the business places a greater reliance on finding rational reasons to trust than the co-worker group.

4.6.4 Comparison of affective-based trust

The means score for affective-based trust are 3.50 for the leadership group and 3.35 for the co-worker group. With a d-value of 0.208 and a non-parametric effect size of 0.075, the difference in mean values is practically negligible. This means that both the leadership and co-worker groups experience affective trust at similar levels within the organisation.

4.6.5 Comparison of organisational innovativeness

The means scores for organisational innovativeness are 3.27 for the leadership group and 3.21 for the co-worker group. As with affective-based trust, both the d-value of 0.077 and non-parametric effect size values of 0.035 suggest that the difference is practically negligible. Of all the dimensions tested in this research, organisational innovativeness lowest difference in practical significance. This means that both the leadership and co-worker groups experience organisational innovativeness at similar levels within the organisation

4.7 CORRELATION DISCUSSION FOR THE CO-WORKER AND LEADERSHIP GROUPS

As with the determination of the correlation relationships for the aggregated dimensions scores, Spearman's rank order correlation coefficients were also calculated to determine the nature and strength of the correlations between the identified dimensions of trust and organisational innovativeness for both the leadership and co-worker groups. Values of ±0.1 represent a small effect, ±0.3 is a medium effect and ±0.5 is a large effect (Field, 2009:170)

while a positive value (+) indicates a positive correlation between two variables and a negative value (-) indicates a negative correlation between two variables.

For the leadership group, it is important to mention that the Spearman's rank order correlation coefficients were calculated using a small sample (n=8). As such, any interpretations made based on these calculations, should be undertaken with great caution. The summaries for the Spearman's rank order correlation for the co-worker and leadership group are given in Appendix F.

4.7.1 Correlations between the dimensions of interpersonal trust and organisational innovativeness for the co-worker group

Table 24 is a summary of the Spearman's rank order correlations coefficients for the co-worker group. All the dimensions of interpersonal trust have a significant positive correlation with organisational innovativeness. The correlation coefficients range from 0.533 for cognitive-based trust to 0.724 for lateral trust. The correlations between cognitive-based trust and organisational innovativeness and affective-based trust and organisational innovativeness are very similar. This would suggest that both types of trust are highly correlated to an environment conducive to organisational innovativeness. As with cognitive- and affective-based trust, both lateral and vertical are highly correlated to an environment conducive to organisational innovativeness.

4.7.2 Correlations between the dimensions of interpersonal trust and organisational innovativeness for the leadership group

Table 25 is a summary of the Spearman's rank order correlation coefficients for the leadership group. All the dimensions of interpersonal trust, with the exception of lateral trust, have a significant positive correlation with organisational innovativeness. The correlation coefficients for these dimensions range between 0.542 and 0.790. When considering the correlation between organisational innovativeness and lateral trust, a correlation coefficient of 0.084 has been calculated. This would suggest that there is no practically significant correlation between lateral trust among the business leadership team and organisational innovativeness. The result may suggest that the business leadership operates within functional silos and that these individual do not view trust between each other as a prerequisite to the development of an innovative environment.

4.8 CONCLUSION

To begin with, the impact of using non-probability sampling techniques has to be explained. Ellis and Steyn (2003:51) cautioned against erroneously analysing data collected from convenience sampling as if it were obtained from random sampling, where statistical inferences and p-values are used. For convenience sampling, statistical inference and p-values are not relevant. For this reason p-values were reported for completeness, however, the interpretation of data was based on effect sizes. The analysis of data was conducted using SPSS (2009) and STATISTICA (2011).

Over a period of ten days a total of 95 respondents completed the questionnaire resulting in a response rate of 52.3%. A concern was raised with the phrasing of question 5 (i.e. to which Sasol group do you belong?), resulting in several managers and co-workers marking two options in this question. For all the respondents who marked two options in question five, a missing response was assigned for this question. No other questions were affected.

Cronbach's' alpha coefficients and inter-item correlations were used to determine the reliability of the questionnaire. A Cronbach's alpha result of >0.6 was deemed acceptable for this reasearch paper. Typically, when broader, higher order constructs are being measured as was the case in this study, a mean inter-item-correlations value of >0.2 (Clark and Watson, 1995:316) is deemed acceptable. An analysis of these results indicated that all scales used to measure the selected dimensions were sufficiently reliable. The only concerns were the results relating to the cognitive trust dimensions with a mean inter item correlation value of 0.234. This was attributed to the possible misunderstanding of the reverse question CT02.

Mean and standard deviation calculations were used as the descriptive statistic measures for the data collected from the respondents. The mean scores for the aggregated dimensions of interpersonal trust and organisational innovativeness range between 3.13 and 3.45. This would suggest that the respondents are moderately positive about interpersonal trust and organisational innovativeness in the Chlor Alkali Business.

Spearman's rank order correlations were calculated to determine the nature and strength of the correlations between the identified dimensions of trust and organisational innovativeness. As noted by Field (2009:170) a value of ± 0.5 indicates a significant correlation between two variables. Based on the results summarised in table 18, it can be concluded that there are significant positive correlations between the overall, selected

dimensions of interpersonal trust and the overall organisational innovativeness construct. Thus all four hypotheses were supported by the research.

Table 18: Research hypothesis and Spearman's rho calculation results

Hypothesis	Description	Spearman's rho
H1	Organisational innovativeness is positively correlated to the strength of lateral trust in an organisation.	0.679
H2	Organisational innovativeness is positively correlated to the strength of vertical trust in an organisation.	0.717
H3	Organisational innovativeness is positively correlated to the strength of cognitive-based trust in an organisation	0.580
H4	Organisational innovativeness is positively correlated to the strength of affective-based trust in an organisation	0.619

(Source: Researcher)

For the purposes of this research, any conclusions made were based on effect size and focused on the practical significance of the results as applied to the sample group and not the population in its entirety. For the comparisons of the mean scores of the leadership and co-worker groups across the selected constructs both parametric (i.e. independent t-tests) and non-parametric (i.e. Mann-Whitney) tests were conducted. Parametric and non-parametric effect sizes were also calculated to determine whether or not there were practically significant differences in the means scores of the leadership and co-worker groups across the selected constructs. For all the comparisons, with the exception of cognitive-based trust, small or negligible effects were found, indicating that there were no practically significant differences in the mean scores of the leadership and co-worker group.

In terms of cognitive-based trust a medium effect was found which means that there is a practically visible difference in the means scores of the co-worker and leadership group. A mean score of 3.56 for the leadership group suggests that they place a greater reliance on finding rational reasons to trusts than the co-worker group.

The final discussion in the chapter revolved around the correlation coefficients calculated for the co-worker and leadership group separately. For the co-worker group, the findings suggest that all four dimensions of trust are correlated to organisational innovativeness. Similar findings were made with regards to the leadership group with the exception of lateral trust. In this case it was found that there was practically no correlation between this construct and organisational innovativeness.

4.9 CHAPTER SUMMARY

Chapter Four focussed on the empirical results of the research. In the introduction of this chapter the implications of using *non-probability sampling techniques* were discussed. Essentially the decision to use this sampling method meant that the interpretation of data would be based on *effect sizes* and that the reporting of p-values would be done for completeness alone. It was also stated that the analysis of data was conducted using SPSS (2009) and STATISTICA (2010).

In the next section the demographics of the respondents were discussed. As a starting point it was determined that at a *response rate* of 52.3% sufficient data was gathered to make statistical inferences for the target group. The first limitation to the study was also identified. That is that for Question Five several respondents, most notably in the leadership group, marked more than one option in the demographic section of the questionnaire. The decision was taken, in consultation with the NWU statistical consultant, to consider the responses to Question Five where two options were marked as missing values. This resulted in a small group indicated as managers (i.e. only eight) and, as such, analysis for the leadership group should be interpreted with great caution.

The *reliability* of the survey instruments was verified using *Cronbach's alpha coefficients* and mean *inter-item correlations*. For the purpose of this research an alpha result of >0.6 and a mean inter-item correlation of >0.2 was deemed acceptable. The Cronbach's alpha results for all the constructs exceeded the 0.6 threshold indicating that the survey instrument had acceptable levels of reliability. The alpha results for several of the construct exceeded 0.9 and these finding were addresses as well. In terms of the mean inter-item correlations of the instrument all the constructs exceeded the 0.2 threshold. Therefore it was concluded that the survey instrument reliably measure the overall dimensions interpersonal trust and organisational innovativeness as well as the identified sub-constructs.

A discussion of the descriptive statistics for the aggregated dimension scores followed using the *mean* and *standard deviation* measures of the data gathered. These scores indicated that the respondents were only moderately positive about interpersonal trust and organisation innovativeness within the business unit. Two areas of concern were highlighted. Firstly the benevolence construct scored relatively low in comparison with the other constructs. The second area of concern was the relatively low mean scores for the product and strategic innovativeness construct. On the positive side, most the respondents were relatively positive about their ability to influence the product process.

Spearman's rank order correlation calculations were conducted to determine the nature and strength of the correlation between the identified dimensions of interpersonal trust and organisational innovativeness. The correlation coefficients of all the dimensions exceeded the 0.5 mark indicating that there was a significant positive correlation between the trust constructs and organisational innovativeness*. Thus all four hypotheses put forward in this research were supported.*

Both parametric and non-parametric effect sizes were calculated for use in the comparison of all the dimensions of trust and organisational innovativeness for the leadership and co-worker groups. Comparisons of the parametric effect size was undertaken using Cohan's d-values the non-parametric effect size calculated as part of the Mann-Whitney test conducted across all the dimensions. With the exception of cognitive-based trust, all the dimensions showed a small effect and no visible differences occurred in the practical significance of the mean scores for the co-worker and leadership groups.

The final analysis undertaken in this chapter was the comparison of the correlation coefficients for the co-worker and leadership group. When looking at the co-worker group, all the dimensions of the interpersonal trust have a significant positive linear correlation with organisational innovativeness. Similar results were found for the leadership group with the exception of the lateral trust construct. For this dimension, the results suggest that there is practically no correlation between lateral trust in the leadership group and organisational innovativeness. The conclusions and recommendations for this research document will be given in the following chapter.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The primary objective of the research was to explore the relationship between the cognitive affective, lateral and vertical dimensions of interpersonal trust and the presence of an innovative environment within the Sasol Polymers, Chlor Alkali Business. The population group for this study was selected based on the roles they play in the business as it pertains to the maintenance and operation of the business assets. Included in the population were those individual who are responsible for the implementation of improvement projects in the business.

Prior to the commencement of the research a greater understanding of the interpersonal trust and organisational innovativeness was required. Chapter two comprised a literature review of these topics. As a starting point interpersonal trust was defined. This was followed by a discussion of Mayer *et al*. (1995) trust model focussing on the trust mechanisms and outcomes. Included in the review was as discussion on lateral, vertical, cognitive- and affective-based trust. The final portion of the review was dedicated to defining organisational innovativeness and gaining a better understanding of the dimensions of this construct.

Chapter three focussed on the empirical investigation. To place the investigation in context a brief overview of the Chlor Alkali business was given. The target group was defined and a qualitative approach was selected as the most appropriate methodology to achieve the objectives of my research. The final portion of the chapter was dedicated to the compilation of a suitable questionnaire. The survey instrument consisted of 62 items in total source from the works of Ellonen *et al.* (2008) and Ferda and Ozen (2003). Using Cronbach's alpha correlation coefficients the historical reliability of the proposed questionnaire was confirmed.

In Chapter four the empirical results were presented. The descriptive statistics for the aggregated dimensions scores were discussed and the reliability of the constructs in the survey instrument were confirmed using the Cronbach's alpha correlation coefficients and inter-item correlations. Spearman's rank order correlation coefficients were calculated to determine the nature and strength of the correlations between the identified dimensions of interpersonal trust and organisational innovativeness. The major finding was that all the hypotheses proposed in this research document were supported, that it, that there is a significant positive relationship between lateral, vertical, cognitive- and affective based trust and organisational innovativeness. The remainder of the chapter focussed on drawing comparisons between the co-worker and leadership group.

This chapter is dedicated to summarizing the findings of the study. Recommendations will be made to the Chlor Alkali leadership focusing on improving the levels of interpersonal trust and organizational innovativeness in the business unit.

5.2 RESEARCH LIMITATIONS

Although the use of a quantitative approach to this study was deemed suitable, my inexperience in compiling research questionnaires created some confusion among the respondents. As mentioned in the previous chapter, 16 respondents marked two options to the question and one respondent did not complete the question at all. This resulted in a small group indicated as managers (i.e. only eight) and, as such, analysis for the leadership group should be interpreted with great caution. It is important to remember that the remainder of the questions in the questionnaire were not affected by the assignment of missing values to question five.

The use of standardised questionnaires, sourced from Ellonen *et al.* (2008) and Ferda and Ozen (2003), simplified the research. However, based on the responses, it became evident that the grammatical phasing of item CT02 impacted on the reliability of the cognitive-based trust section of the questionnaire. To make improvements for future studies, I would suggest that the items relating to cognitive- and affective-based trust be standardised for the South African environment.

The final limitation would be the fact that there were very few reverse question items in the questionnaire. In total there were 57 items relating to the selected dimensions of interpersonal trust and organisational innovativeness. Of these, only three were in the reverse question format, CT02 being one of them. The use of standardised questionnaires simplified the construction of the questionnaire but, in doing so, it was not possible rephrase those questions where the grammatical phrasing of the reverse questions was a source of concern. The end result is the fact that the omission of a suitable number of reverse questions may lead to response bias from the respondents. To remedy this I would suggest that all the items in the questionnaire be standardised for the South African environment, including the rephrasing of selected items such that a suitable number of items have reverse phrasing.

5.3 CONTRIBUTION TO ACADEMIC KNOWLEDGE

Both the topics of interpersonal trust and organisational innovativeness have been extensively researched by academics across the globe. The research that has been

completed focuses mainly on improving the understanding of the antecedent, mechanism and outcomes of these constructs. However, limited research has been conducted with a view to determining the relationship between the agreed dimensions interpersonal trust and organisational innovativeness. This research document is further proof of the relationship and contributes to a better understanding of the above mentioned relationship within the South African context.

During the literature review conducted as part of this research, many different aspects relating to these two constructs were found, however, no definitive study was found where attempts were made to establish and quantify the relationship between cognitive- and affective-based trusts and organisational innovativeness. Despite the limitation to the study, this research document confirms that a relationship exists which will hopefully prompt future researchers to continue the investigations on the relationship.

5.4 SUMMARY OF MAIN FINDINGS

Firstly the mean values for all the identified dimensions of interpersonal trust and organisational innovativeness would suggest that the respondents are only moderately positive about the levels of interpersonal trust and organisational innovativeness within the business. The Chlor-Alkali Business operations are staffed with a highly unionised workforce and therefore I would suggest that the moderately positive views on trust should be used as a starting point in improving the relationship between the business leadership and its workforce.

This finding is supported by the fact that all of the constructs achieved Spearman's rank order correlation results of greater than 0.5. Thus all four hypotheses were supported. This support highlights the fact that, although a cause-and-effect relationship has not been proven, the existence of high levels of interpersonal trust will contribute to increased levels of organisational innovativeness within the Chlor Alkali Business.

When considering the comparisons for the leadership and co-worker groups across all the dimensions, the study reveals some interesting results. Firstly, for both groups, no practically significant difference was found between the mean values with the exception of cognitive-based trust. What this means is both the leadership and co-worker groups experience co-worker, leadership, affective-based trust and organisational innovativeness at similar levels within the organisation. For the cognitive-based trust contrast there is a practically significant difference in the mean scores between the leadership and co-worker groups. As mentioned

in Chapter 4, this may indicate that the leadership groups places a greater emphasis on finding rational reasons to trust both one another and their direct reports.

When considering the co-worker group, it is evident that these respondents feel that the presence of both cognitive-and affective-based trust has a role to play in improving the organisational innovativeness of the Chlor-Alkali Business. This is a significant finding. Throughout the process of conducting the literature review for this study, no research was found linking these two dimensions of trust to organisational innovativeness. I would therefore suggest that this should be considered as a topic for future research.

The relatively high correlation between vertical and lateral trust and organisational innovativeness was expected. The individuals working at the “coal face” of an organisation have a wealth of practical knowledge about how the production and maintenance processes work. Therefore improving the levels of trust amongst this group could potentially encourage these individual to share ideas, highlight problem areas and suggest practical solution to resolve operational issues. The leadership group is the “gate-keeper” of any innovative endeavour. They hold the keys to unlocking the resources (financial and otherwise) required to implement business innovations. The co-worker group highlighted the fact that trust in their leadership is a key ingredient in creating that innovative environment. During the literature review, numerous articles were found to support this view-point. Included in this document is a basic summary of the fundamental leadership behaviours and styles which are conducive to innovation within a given business.

The final conclusion that is drawn from the study is based on the correlation comparison for the leadership group. The correlation coefficient calculated indicated that there is practically no correlation between interpersonal trust among the business leadership and organisational innovativeness. Although the sample size was made up of eight individuals, this finding hints at the fact that individuals at this level of the organisation do not view interpersonal trust as a prerequisite for organisational innovativeness. As mentioned before it is my belief that this finding is related to the fact that there is a propensity within the business for leaders to operate in entrenched functional silos. To create a beneficial innovative environment, these silos have to be broken down.

5.5 RECOMMENDATIONS

As mentioned in the previous section the individuals in the target group are only moderately positive about the levels of interpersonal trust and organisational innovativeness within the business. There is more than enough research confirming that businesses’, operating in

environments where people display trust-building behaviours reap the benefits on the bottom line. Meyer *et al*.'s (1995) model of trust can be used as a starting point to improve the levels of trust in the business. I would recommend that the business constantly reminds people of the importance "living" the Sasol Values. By doing so they will, over a period of time, re-inforce all three facets of trustworthiness mentioned in Meyer *et al*.'s (1995) model, thus improving the levels of trust in the business.

Another finding of the research highlights the possibility that the leadership group may place a greater reliance on finding rational (cognitive) reasons to trust one another as well as their direct reports. This could be expected to a certain extent. In a large organisation like Sasol, high levels of bureaucracy are bound to creep in in an attempt to standardise rules, procedures processes and systems. The bureaucracy may give the impression that managers require structured checks and balances to build trust. While this "control" is acceptable to a certain extent and may reinforce a cognitive-based trust relationship, affective-based trust relationships are harder to foster in this environment.

As mentioned in Chapter two, affective-based trust can only exist when an emotional bond is created between the trustor and trustee (Lewis & Weigert, 1995:971) and is underpinned by the fact that the perceived trustworthiness of the trustee is assured, based on the confidence created by repeated interactions which are backed up by empirical evidence (Jones & George, 1998:536-537). Looking at Mayer *et al.*'s model, I would recommend to managers that they increase the trustworthiness of their direct reports by doing three things. Firstly, by ensuring that the competency and skill set gaps are identified and rectified, secondly, by continuously demonstrating caring behaviours and, thirdly, by ensuring that all interactions are governed by a set of accepted ethical behaviours.

5.6 CONCLUSION

In my view interpersonal trust and organisational innovativeness are two constructs that are on opposite sides of an emotional spectrum. As stated before it is my belief that trust forms the basis for all successful relationships and is based on human interaction with the ultimate goal of creating personal value in all spheres of a person's life. Organisational innovativeness focuses on improving business performance and the cold, hard drive to increase business profits. What the study shows is that there is a very real link between the two. As such it is incumbent on the business leadership in the Chlor Alkali Business to actively pursue an improvement in the levels of trust within the business. By doing so, they will lay down one of the numerous foundations required to a facilitate business performance improvement through the continuous innovation of business systems and processes.

BIBLIOGRAPHY

Allen, N.J. & Meyer, J.P. 1990. The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of occupational psychology*, 63(1):1-18.

Anderson, N.R. & West, M.A. 1998. Measuring climate for work group innovation: development and validation of the team climate theory. *Journal of organisational behaviour*, 19, 235 – 258.

Baltzan, P., Phillips, A. & Haag, S. 2009. Business driven technology. 3rd ed. New York: McGraw-Hill/Irwin.

Bass, B.M., Avolio, B.J., Jung, D.I. & Berson, Y. 2003. Predicting unit performance by assessing transformational and transactional leadership. *Journal of applied psychology*, 88(2):207–218.

Bhattacharya, R., Devinney, T.M. & Pillutla, M.M. 1998. A formal model of trust based on outcomes. *The academy of management review*, 23(3):459 – 472.

Bolino, M.C., Turnely, W.H. & Bloodgood, J.M. 2002. Citizenship behavior and the creation of social capital in organisations. *The academy of management review*, 27(4):505 – 522.

Benner, M.J. & Tushman, M.L. 2003. Exploitation, exploration and process management: The productivity dilemma revisited. *The academy of management review*, 28(2): 238 – 256.

Burke, C.S., Simms, D.E., Lazzara, E.H. & Salas, E. 2007. Trust in leadership: A multi level review and integration. *The leadership quarterly*, 18: 606 – 632.

Chiles, T.H. & McMackin, J.F. 1996. Integrating variable risk preferences, trust, and transaction cost economics. *The academy of management review,* 21(1): 73 – 99.

Christensen, C. 1997. The innovators dilemma: When new technologies cause great firms to fail. Massachusetts:Harvard Business School Press.

Clark, L.A. & Watson, D. 1995. Constructing Validity: Basic Issues in Objective Scale Development. *Psychological assessment,* 7(3):309-319.

Clegg, C., Unsworth, K., Epitropaki, O. & Parker, G. 2002. Implicating trust in the innovation process. J*ournal of occupational and organisational psychology*, 75:409 – 422.

Colquitt, J.A., Scott, B.A. & Lepine, J.A. 2007. Trust, trustworthiness, and trust propensity: A meta-analytic test of their unique relationships with risk taking and job performance. *Journal of applied psychology*, 92(4):909 – 927.

Coppola, N.W., Hiltz, S.R. & Rotter, N.G. 2004. Building trust in virtual teams. *Transactions on professional communication*, 4(2):95 – 104.

Costa, A.C. 2003. Work team trust and effectiveness. *Personnel review,* 32(5):605 – 622.

Cummings, T. G. & Worley, C.G. 2009. Organization development & change. 9th ed. Ohio: South Western Cengage Learning.

Davis, J.H., Schoorman, F.D., Mayer, R.C. & Tan, H.H. 2000. The trusted general manager and business unit performance: Empirical evidence of a competitive advantage. *Strategic management journal,* 21(5):563 – 576.

Den Hartog, D.N., Shippers, M.C. & Koopman, P.L. 2002. The impact of leader behaviour on trust in management and co-workers. *SA journal of industrial psychology*, 28(4):29 – 34.

Dirks, K.T. & Ferrin, D.L. 2002. Trust in leadership: Meta-Analytic findings and implications for research and practice. *Journal of applied psychology*, 87(4):611-628.

Dovey, K. 2009. The role of trust in innovation. *The learning organisation*, 16(4):311 – 325.

Ellis, S.M. & Steyn, H.S. 2003. Practical significance (effect sizes) versus or in combination with statistical significance (p-values). *Management Dynamics*, 12(4): 51-53.

Ellonen, R., Blomqvist, K. & Puumalainen, K. 2008. The role of trust in organisational innovativeness. *European journal of innovation management*, 11(2):160 - 181.

Engelbrecht, A.S. & Chamberlain, L. 2005. The influence of transformational leadership on organisational citizenship behaviour through justice and trust. *Management dynamics,* 14(1):2 – 13.

Erdem, F. & Ozen, J. 2003. Cognitive and affective dimensions of trust in developing team performance. *Team performance management: an international journal,* 9(5):131 - 135.

Ferrin, D.L., Dirks, K.T. & Shah, P.P. 2006. Direct and indirect effects of third party relations on interpersonal trust. *Journal of applied psychology,* 91(4):870 – 883.

Ferres, N., Connell, J. & Travaglione, A. 2004. Co-worker trust as a social catalyst for constructive employee attitudes. *Journal of managerial psychology,* 19(6):608 – 622.

Field, A. 2009. Discovering statistics using SPSS. 3rd ed. London: Sage Publications.

Gillespie, N.A. Mann, L. 2004. Transformational leadership and shared values: the building blocks of trust. *Journal of managerial psychology,* 19(6):588 – 607.

Gill, H., Bois, K., Finegan, J.E. & McNally, Y. 2005. Antecedents of trust: Establishing a boundary condition for the relation between propensity to trust and intention to trust. *Journal of business and psychology,* 19(3):287 – 302.

Goh, S.C. 2002. Managing effective knowledge transfer: An integrated framework and some practical implications. *Journal of knowledge management,* 6(1):23 – 30.

Haldin-Herrgard, T. 2000. Difficulties in diffusion of tacit knowledge in organizations. *Journal of intellectual capital*, 1(4):357 – 365.

Holster, J.S. & Fields, D. 2010. Trust and tacit knowledge transfer and use. *Journal of knowledge m*anagement, 14(1):128 – 140.

Holloway, I. 1997. Basic concepts for qualitative research. Oxford:Blackwell Science.

Hosmer, L.T. 1995. Trust: The connecting link between organisational theory and philosophical ethics. *The academy of management review*, 20(2):379 – 403.

Howells, J. 1996. Tacit knowledge, innovation and technology transfer. *Technology analysis and strategic Management*, 8(2):91 – 106.

Joia, L. & Lemos, B. 2010. Relevant factors for tacit knowledge transfer within organisations. *Journal of knowledge management,* 14(3):410 – 427.

Joiner, T.A. & Bakalis, S. 2006. The antecedents of organisational commitment: The case of Australian casual academics. *International journal of educational management*, 20(6):439 – 452.

Jones, G.R. & George, J.M. 1998. The experience and evolution of trust: Implications for cooperation and teamwork. *The academy of management review,* 23(3):531 – 546.

Judge, T.A. & Piccolo, R.F. 2004. Transformational and transactional leadership: A meta-analytic test of their relative validity. *Journal of applied psychology*, 89(5):755–768.

Kanter, R.M. 1968. Commitment and social organisations: A study of commitment mechanisms in utopian communities. *American sociological review*, 33(4):499 – 517.

Konovsky, M.A. & Pugh, S.D. 1994. Citizenship behaviour and social exchange. *Academy of management journal*, 37(3):656 – 669.

Koskinen, K.U. 2003. Evaluation of tacit knowledge utilization in work units. *Journal of knowledge management,* 7(5):67 – 81.

Kotler, P. & Armstrong, P. 2009. Principles of marketing. 13th ed. New Jersey:Pearson Prentice Hall.

Krafft, P., Engelbrecht, A.S. & Theron, C.C. 2004. The influence of transformational and transactional leadership on dyadic trust relationships through perceptions of fairness. *SA journal of psychology,* 30(1):10 – 18.

Kreiner, R. & Kinicki, A. 2008. Organisational behaviour. 8th ed. New York: McGraw-Hill/Irwin.

Lau, D.C. & Linden, R.C. 2008. Antecedents of coworker trust: Leader's blessing. *Journal of applied psychology*, 93(5):1130 - 1138.

Levine, D. M., Stephan, D. F., Krehbiel, T. C. & Berenson, M. L. 2008. Statistic for managers using Microsoft® Excel. 5th ed. New Jersey: Pearson Prentice Hall.

Lewis, J.D. & Weigert, A. 1985. Trust as a social reality. *Social forces*, 63(4):967 – 985. http://www.jstor.org.nwulib.nwu.ac.za/stable/pdfplus/2578601.pdf. Date of access: 22 May 2011.

Martins, E.C. & Terblanche, F. 2003. Building organisational culture that stimulates creativity and innovation. *European journal of innovation management*, 6(1):64 – 74.

Mayer, R.C., Davis, H.D. & Schoorman, F. D.1995. An integrated model of organisational trust. *The academy of management review*, 20(3):709 – 734.

Mayer, R.C. & Gavin, M.B. Trust in management and performance: Who minds the shop while the employees watch the boss? *Academy of management journal*, 48(5):874 – 888.

McAllister, D.J. 1995. Affect-and conition-based trust as foundations for interpersonal cooperation in organisation. *Academy of management journal,* 38(1):24 – 59.

McKnight, D.H., Cumming, L.L. & Chervany, N.L. 1998. Initial trust formation in new organisational relationships. *The academy of management review,* 23(3):473 – 490.

Morrow, J.L., Hansen, M.H. & Pearson, A.W. 2004. The cognitive and affective antecedents of general trust within cooperative organsations. J*ournal of management issues*, 16(1):48 – 64.

Nunnally, J. & Bernstein, I. H. 1994. Psychometric theory. 3rd ed. New York: McGraw-Hill/Irwin. http://phi.uhce.ox.ac.uk/pdf/ChronicConditions/ch1_introduction.pdf Date of access : 27 Mar. 2012

Nandhakumar, J. & Baskerville, R. 2006. Durability of online teamworking:patterns of trust. *Einformation technology & people*, 19(4):371 - 389.

Oxford advanced learners dictionary. 2010. Oxford, NewYork:Oxford University Press.

Padsokoff, P.M., Mackenzie, S.B., Moorman, R.H. & Fetter, R. Transformational leadership behaviours and their effects on followers' trust in leaders, satisfaction, and organizational citizen behaviours. *Leadership quarterly,* 1(2):102 – 142.

Panuwatmanich, K., Stewart, R.A. & Mohamed, S. 2008. The role of climate for innovation in enhancing business performance: The case of design firms. *Engineering, construction and architectural management*, 15(5):407 – 422.

Robbins, S.P. 2001. Organisational Behaviour. 9th ed. New Jersey: Prentice Hall.

Robbins, S.P., Odendaal, A. & Roodt, G. 2003. Organisational behaviour: Global and Southern African perspective. Cape Town: Pearson Education.

Robert Wood Johnson Foundation. 2012. Qualitative research project guideline. http://www.qualres.org/HomeWhat-3513.html Date of access: 6th March 2012

Rousseau, D.M., Sitkin, S.B., Burt, R.S. & Camerer, C. 1998. Not so different after all: A cross-discipline view of trust. *The academy of management review*, 20(3):393 – 404.

SAS Institute Inc., 2005. SAS Institute Inc., SAS OnlineDoc®, Version 9.1, Cary, NC

Schoorman, F.D., Mayer, R.C. & Davis, J.H. 2007. An integrated model of organisational trust: past, present, and future. *The academy of management review*, 32(2):334 – 354.

Semeriöz, F., Hassan, M. & Aldermir, Z. 2011. An empirical study on the role of interpersonal and institutional trust in organisational innovativeness. *International business research*, 4(2):125 – 136.

Serva, M.A., Fuller, M.A. & Mayer, R.C. 2005. The reciprocal nature of trust: A longitudinal study of interacting teams. *Journal of organisational behaviour*, 26(6):625 – 648.

Six, F. & Skinner, D. 2010. Managing trust in interpersonal work relationship: evidence from two Dutch organisations. *The international journal of human resource management*, 21(1):109 – 124.

Solinger, O.M., Van Olffen, W. & Roe, R.A. 2008. Beyond the three-component model of organisational commitment. *Journal of applied psychology*, 93(1):70 – 83.

SPSS Inc. (2009). PASW Statistics 18, Release Version 18.0.0. Copyright© by SPSS, Inc., Chicago, IL. www.spss.com.

StatSoft. Inc. (2011). STATISTICA (data analysis software system), version 10. www.statsoft.com.

Streiner, D.L. 2003. Starting at the beginning: an introduction to coefficient alpha and internal consistency. *Journal of personality assessment*, 80(1):99-102.

Surujlal, J. & Zhang, Z. 2009. Trust in leadership in sport: An empirical study of ethnicity and gender. *African journal for physical, health education, recreation and dance (AJPHERD)*, Supplement:125 – 140.

Tierney, P. 1999. Work relations as a precursor to a psychological climate for change: The role of work group supervisors and peers. *Journal of organisational change*, 12(2):120 – 133.

Wayne, K.H. 2009. Qualitative research in education: A primer. California: Sage Publications.

Wang, C.L. & Ahmed, P.K. 2004. The development and validation of the organisational innovativeness construct using confirmatory factor analysis. *European journal of innovation management*, 7(4):303 – 313.

Welman, C., Kruger, F. & Mitchell, B. 2010. Research Methodology. 3rd ed. Cape Town: Oxford University Press.

West, M.A. 2002. Sparkling fountains or stagnant ponds: An integrated model for creativity and innovation implementation in work groups. *Applied psychology: an international review*, 51(3):355 – 424.

Appendix A – Interpersonal trust and innovation questionnaire

Dear Colleagues,

In order to successfully complete my MBA degree I am required to submit a mini-dissertation. The topic of my mini-dissertation is **"**Investigating interpersonal trust and innovation within a petrochemical organisation". By completing this questionaire you will greatly assist me in this endeavor.

The aim of this questionnaire is to establish the whether there a positive correlation between selected dimensions of interpersonal trust and the presences of an innovative environment within our business unit. The study is solely for academic purposes and should take you between 15 to 20 minutes to complete. Please take note that all the **responses will be treated in the strictest of confidence** from the analysis of the data, through the presentation of the results and in the discussion of the outcomes. The construction of a personal code will be requested to ensure complete anonymity.

Please answer each question honestly from your perspective in your current working environment and work groups. **Please mark your answer clearly with an X**.

I would like to thank you in advance for taking the time to completing the questionnaire; you have my heart-felt thanks.

Regards

Andrew Jearey

Introduction

These questions investigate the relationship between interpersonal trust and organizational innovativeness. You are requested to construct a personal code by following the instructions given below. The code will only be known to you, and thus presents no danger of harming your anonymity or the confidentiality of the information's given herein. If a future study is conducted, focusing on trust and organizational innovativeness, you will be asked the same questions, in order for you to reconstruct your personal code. This code will enable the researcher to study the development of trust and organizational innovativeness over a period of time, while you remain anonymous. Below is an example of how your code is constructed.

Example of how to create your own personal code

Coding questions	**Example**
Give the first and last letter of the city or town you were born in	**J**ohannesbur**g** = JG
Give the first and last letters of your mother's surname before she got married	**V**ennin**g** = VG
Give the first and last letters of your father's name	**D**avi**d** = DD
Personal code	**JGVGDD**

Section A – Demographic Information

PC01	***Coding questions***	***Letters***
1	Give the first and last letter of the city or town you were born in	
2	Give the first and last letters of your mother's surname before she got married	
3	Give the first and last letters of your father's name	
4	**Personal Code =**	

The questions are for analysis purposes (Please mark your responses with an X)

DI01 To which ethnic group do you belong?

1	White	
2	African	
3	Indian	
4	Coloured	

DI02 Are you male or female?

1	Male	
2	Female	

DI03 What is your current age?

DI04 How long have you been working for

Sasol

1	20 – 25 years old		1	0 – 10 years	
2	26 – 35 years old		2	11 – 20 years	
3	36 – 45 years old		3	21 – 30 years	
4	46 – 55 years old		4	31 – 40 years	
5	56 – 65 years old		5	> 40 years	

DI05 To which Sasol group do you belong?

Leadership Group			***Co-worker Group***		
1	Manager of a business		5	Technical person	
2	Manager of a function		6	Discipline specialist	
3	Manager of managers		7	Process artisan/operator	
4	Manager of others		8	Maintenance artisan	

Section B – Lateral & Vertical Trust

Code	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
LT01	The employees in this organisational unit have a strong sense of justice					
LT02	The employees in this organisational unit try hard to be fair in dealings with others					
LT03	The actions and behaviour of the employees in this organisational unit are always consistent					
LT04	Integrity is a key value in the operations of the employees of this organisational unit					
LT05	In general, most employees in this organisational unit keep their promises					
LT06	The employees in this organisational unit communicate openly about things that are important to me					
LT07	The employees in this organisational unit have much knowledge on the work that needs to be done					
LT08	The employees in this organisational unit are known to be successful in what they do					
LT09	I feel very confident about the skills of the employees of the unit					

Code	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
LT10	I believe that most employees in this organisational unit do a very good job at their work					
LT12	A large majority of the employees of this organisational unit are competent in their area of expertise					
LT13	The employees in this organisational unit are concerned with my welfare					
LT14	My needs and desires are important to the employees of this organisational unit					
LT15	A typical employee in this organisational unit is sincerely concerned with the problems of others					
LT16	Most of the times, the employees try to be helpful rather than just look out for themselves					
VT01	The leaders in this organisational unit have a strong sense of justice					
VT02	The leaders in this organisational unit try hard to be fair in dealings with others					
VT03	The actions and behaviour of the leaders in this organisational unit are always consistent					
VT04	Integrity is a key value in the operations of the leaders of this organisational unit					
VT05	In general, most leaders in this organisational unit keep their promises					
VT06	The leaders in this organisational unit communicate openly about things that are important to me					
VT07	The leaders in this organisational unit have much knowledge on the work that needs to be done					
VT08	The leaders in this organisational unit are known to be successful in what they do					
VT09	I feel very confident about the skills of the leaders of the unit					
VT10	I believe that most leaders in this organisational unit do a very good job at their work					
VT12	A large majority of the leaders of this organisational unit are competent in their area of expertise					
VT13	The leaders in this organisational unit are concerned with my welfare					
VT14	My needs and desires are important to the leaders of this organisational unit					
VT15	A typical leader in this organisational unit is sincerely concerned with the problems of others					
VT16	Most of the times, the leaders try to be helpful rather than just look out for themselves					

Section C – Cognitive- & Affective-based trust

Code	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
CT01	Team members fulfil their undertakings successfully.					
CT02	It cannot be said that team members have the necessary qualifications required for team performance.					
CT03	I trust the expertise of team members.					
CT04	Team members' actions reflect his or her word.					
CT05	Team members strive to be honest with each other.					
CT06	If I make a mistake on this team, it is often held against me.					
AF01	You do not easily want help from team members					
AF02	Team members always share all the sources with each other.					
AF03	Team members excourage each other to introduce different ideas and suggestions.					
AF04	Team member respect each others emotions and idea.					
AF05	Team members can ask for help from each other regarding presonal problems.					

Section D – Innovation

Code	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
IN01	In new product and service introductions, this organisational unit is oftenfirst-to-market.					
IN02	The new products and services of this organisational unit are often percieved as very novel and innovative by customers.					
IN03	During the past five years, this organisational unit has introduced more innovative products and services than its competitors..					
IN04	The new products and services of this organisational unit often beat new competitors.					
IN05	In new product and services introduction, this organisational unit is often at the cuting edge of technology.					

Code	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
IN06	Individuals who do things in a different way are accepted and tolerated in this organisational unit.					
IN07	In this organisational unit, people are encouraged to think and behave in original and novel ways.					
IN08	In this organisational unit, people are willing to try new ways of doing things and seek unusual, novel solutions.					
IN09	One gets a lot of support from managers if one wants to try new ways of doing things.					
IN10	When a problem cannot be solved using conventional methods, people in this organisational unit invent new methods.					
IN11	The managers of this organisational unit are willing to take risk to sieze and explore “chancy” growth oppotunities.					
IN12	The managers of this organisationa unit constantly seek unusual, novel solutions to problems through “idea men”.					
IN13	In comparison with its competitors, this orhanisational unit’s most recent product marketing program is revolutionary in the market.					
IN14	This organisational unit improves its business processes.					
IN15	During the past five years, this organisation unit has developed new management processes.					
IN16	This organisational unit changes the production methods faster than its competitors..					

Appendix B – Demographic information

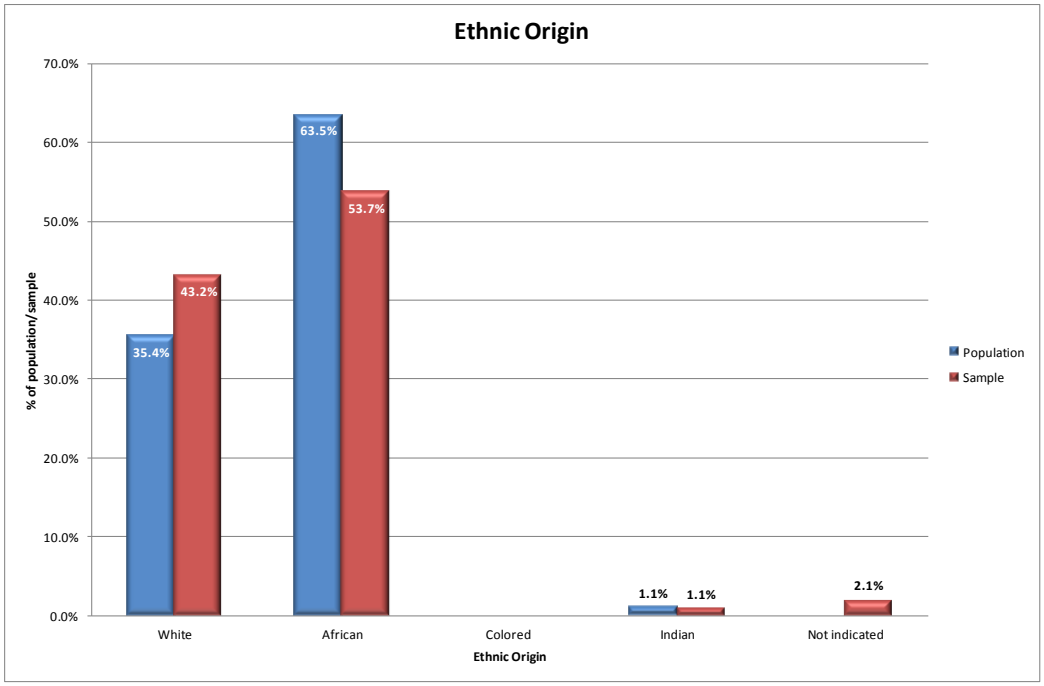


Figure 10: Ethic origin of the population and respondents.
(Source: Researcher)

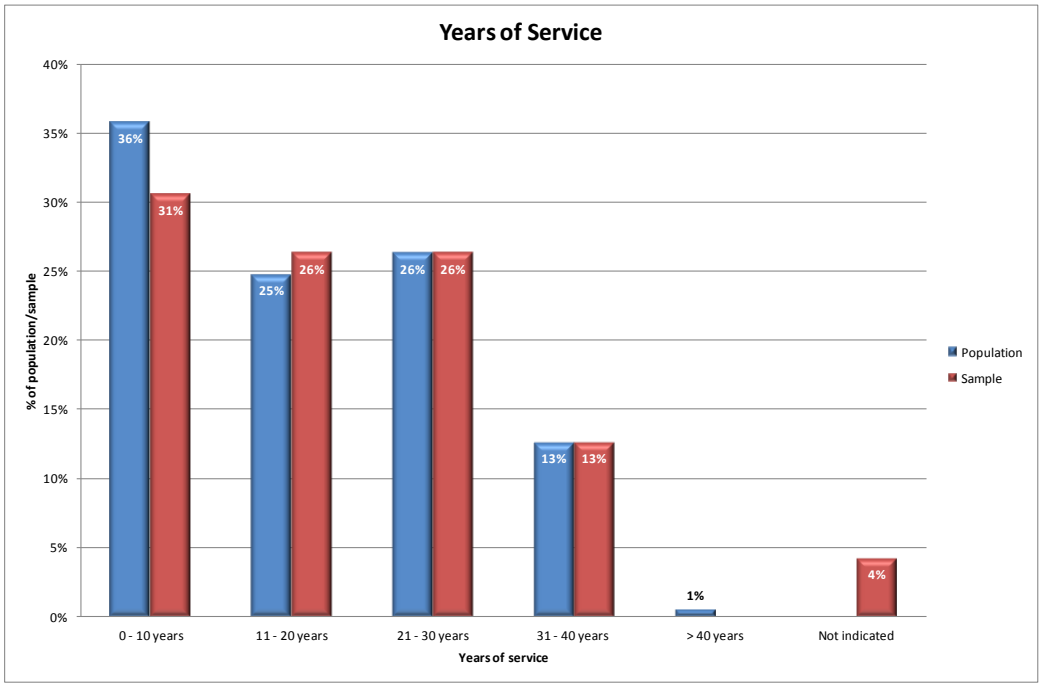


Figure 11: Years of service of the population and respondents.
(Source: Researcher)

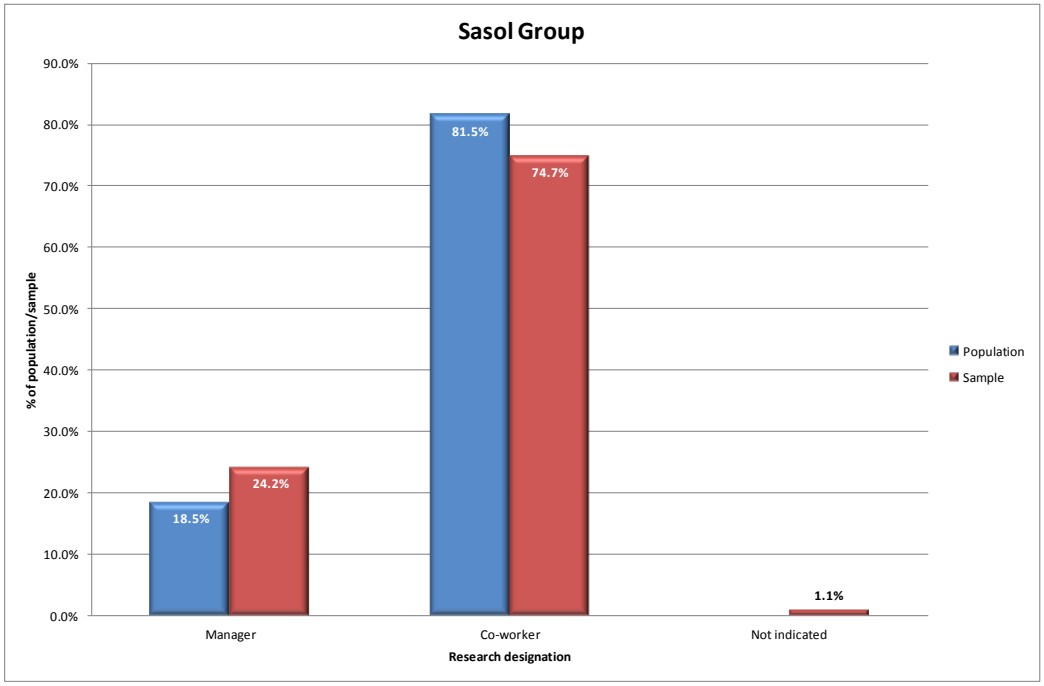
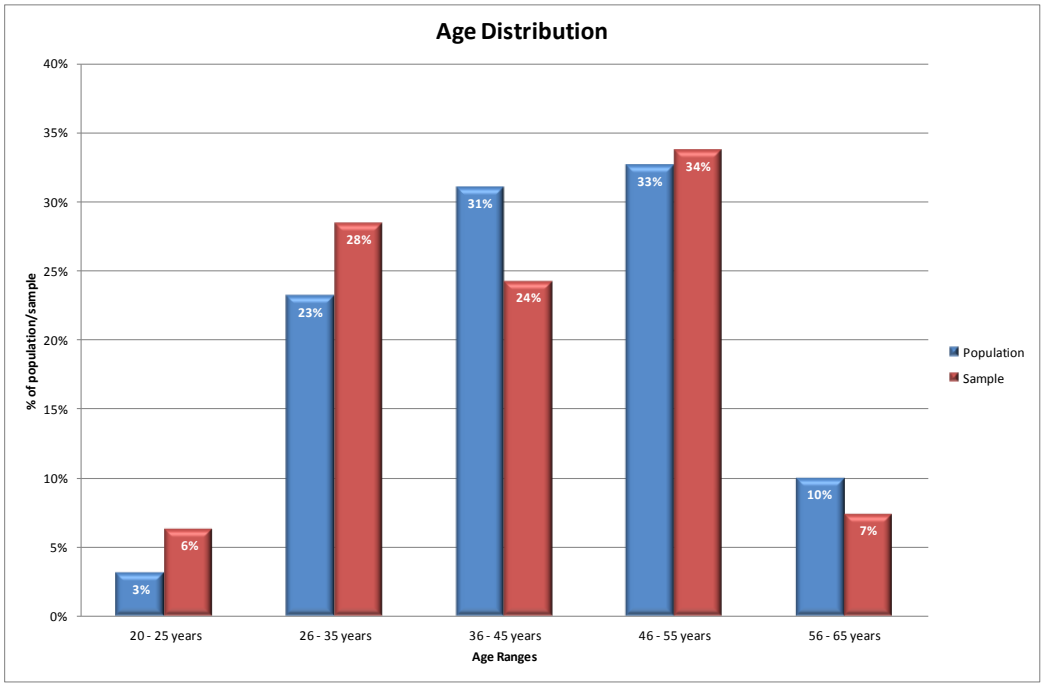


Figure 12: Sasol group distribution of the population and respondents.
(Source: Researcher)



Fugure 13: Sasol group distribution of the population and respondents.
(Source: Researcher)

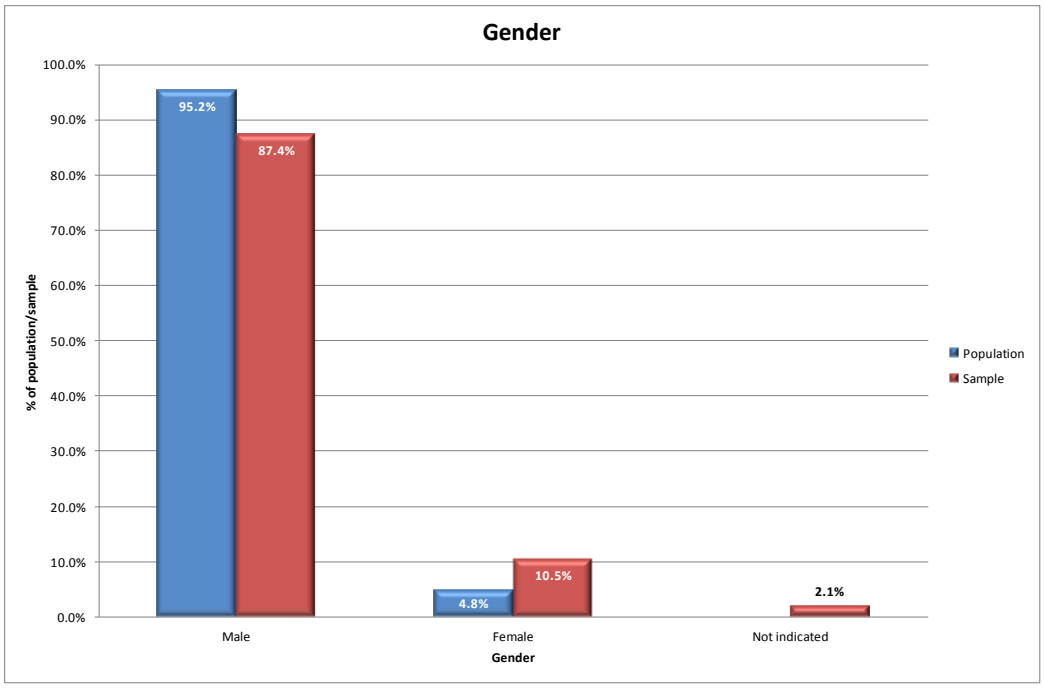


Figure 14: Gender distribution of the population and respondents.
(Source: Researcher)

Appendix C – Frequencies and descriptive statistics for the questionnaire

Table 19: Item scale frequencies and descriptive statistic for co-worker trust

Item	Valid Response Percentages (Likert scale)					Number Missing	Mean	Std. Deviation
	1	2	3	4	5			
LT01	3.2	12.8	36.2	41.5	6.4	-	3.35	0.901
LT02	4.2	20.0	27.4	42.1	6.3	-	3.26	0.922
LT03	4.2	34.7	26.3	32.6	2.1	-	2.94	0.965
LT04	7.4	11.6	27.4	44.2	9.5	-	3.37	1.052
LT05	3.2	23.2	33.7	37.9	2.1	-	3.13	0.902
LT06	5.3	17.9	28.4	38.9	9.5	-	3.29	1.040
LT07	3.2	14.9	22.3	45.7	13.8	1	3.52	1.013
LT08	0.0	13.7	36.8	44.2	5.3	-	3.41	0.792
LT09	6.3	21.1	21.1	40.0	11.6	-	3.29	1.119
LT10	2.1	17.9	21.1	49.5	9.5	-	3.46	0.965
LT12	1.1	14.7	18.9	54.7	10.5	-	3.59	0.905
LT13	5.3	14.7	36.8	37.9	5.3	-	3.23	0.950
LT14	5.3	20.2	37.2	31.9	5.3	1	3.12	0.971
LT15	5.3	26.6	40.4	25.5	2.1	1	2.93	0.907
LT16	7.4	14.7	29.5	37.9	10.5	-	3.29	1.081

Table 20: Item scale frequencies and descriptive statistic for manager trust

Item	Valid Response Percentages (Likert scale)					Number Missing	Mean	Std. Deviation
	1	2	3	4	5			
VT01	9.5	14.7	29.5	38.9	7.4	-	3.20	1.088
VT02	8.4	12.6	35.8	35.8	7.4	-	3.21	1.041
VT03	7.4	25.3	33.7	31.6	2.1	-	2.96	0.978
VT04	7.4	14.7	41.1	26.3	10.5	-	3.18	1.052
VT05	7.4	22.1	36.8	28.4	5.3	-	3.02	1.010
VT06	8.4	14.7	34.7	36.8	5.3	-	3.16	1.024
VT07	4.2	12.6	30.5	42.1	10.5	-	3.42	0.985
VT08	3.2	11.6	41.1	35.8	8.4	-	3.35	0.908
VT09	4.2	11.6	33.7	45.3	5.3	-	3.36	0.910
VT10	3.2	7.4	38.9	47.4	3.2	-	3.40	0.804
VT12	2.1	10.5	27.4	52.6	7.4	-	3.53	0.861
VT13	6.3	17.9	35.8	34.7	5.3	-	3.15	0.989
VT14	8.4	18.9	37.9	27.4	7.4	-	3.06	1.050
VT15	6.3	21.1	37.9	31.6	3.2	-	3.04	0.956
VT16	7.4	14.7	29.5	41.1	7.4	-	3.26	1.044

Table 21: Item scale frequencies and descriptive statistic for cognitive- and affective-based trust

Item	Valid Response Percentages (Likert scale)	Number	Mean	Std.

	1	2	3	4	5	Missing		Deviation
CT01	0.0	10.6	31.9	50.0	7.4	1	3.54	0.785
CT02	1.1	22.3	41.5	29.8	5.3	1	3.16	0.871
CT03	0.0	5.3	29.5	53.7	11.6	-	3.72	0.739
CT04	1.1	9.6	35.1	46.8	7.4	1	3.50	0.813
CT05	2.1	14.7	32.6	43.2	7.4	-	3.39	0.903
CT06	2.1	26.3	33.7	28.4	9.5	-	3.17	0.996
AF01	7.4	44.7	23.4	21.3	3.2	1	2.68	0.997
AF02	4.2	20.0	29.5	41.1	5.3	-	3.23	0.973
AF03	4.3	15.1	34.4	39.8	6.5	-	3.29	0.951
AF04	4.2	16.8	25.3	42.1	11.6	-	3.40	1.036
AF05	3.2	16.8	34.7	36.8	8.4	-	3.31	0.957

Table 22: Item scale frequencies and descriptive statistic for organisational innovativeness

Item	Valid Response Percentages (Likert scale)					Number Missing	Mean	Std. Deviation
	1	2	3	4	5			
IN01	2.1	20.0	41.1	34.7	2.1	-	3.15	0.838
IN02	2.1	9.6	50.0	35.1	3.2	1	3.28	0.768
IN03	6.5	18.3	41.9	26.9	6.5	2	3.09	0.985
IN04	1.1	12.8	49.9	34.0	3.2	1	3.26	0.761
IN05	4.3	20.4	39.8	33.3	2.2	2	3.09	0.893
IN06	5.4	29.0	26.9	34.4	4.3	2	3.03	1.016
IN07	6.4	13.8	30.9	47.9	1.1	1	3.23	0.932
IN08	6.5	18.3	28.0	45.2	2.2	2	3.18	0.977
IN09	5.3	17.0	29.8	43.6	4.3	1	3.24	0.969
IN10	3.2	13.8	27.7	49.9	6.4	1	3.41	0.921
IN11	7.5	24.7	35.5	30.1	2.2	2	2.95	0.971
IN12	6.4	16.0	38.3	37.2	2.1	1	3.13	0.930
IN13	2.2	10.8	54.8	29.0	3.2	2	3.20	0.760
IN14	2.1	9.6	30.9	50.0	7.4	1	3.51	0.852
IN15	1.1	12.8	22.3	54.3	9.6	1	3.59	0.873
IN16	2.2	22.8	45.7	20.7	8.7	3	3.11	0.931

(Source: Researcher)

Appendix D – Scale reliability for cognitive-based trust

Case Processing Summary

		N	%
Cases	Valid	92	96,8
	Excluded[a]	3	3,2
	Total	95	100,0

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

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,633	,648	6

Inter-Item Correlation Matrix

	CT1	CT2r	CT3	CT4	CT5	CT6r
CT1	1,000	-,256	,564	,510	,639	,241
CT2r	-,256	1,000	-,302	-,260	-,264	-,036
CT3	,564	-,302	1,000	,544	,644	,179
CT4	,510	-,260	,544	1,000	,716	,252
CT5	,639	-,264	,644	,716	1,000	,384
CT6r	,241	-,036	,179	,252	,384	1,000

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	,234	-,302	,716	1,017	-2,372	,136	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CT1	16,20	6,357	,564	,452	,515
CT2r	16,89	10,120	-,297	,119	,804
CT3	16,03	6,647	,537	,477	,531
CT4	16,25	6,234	,585	,530	,505
CT5	16,36	5,331	,731	,661	,421
CT6r	16,91	6,608	,329	,160	,607

Appendix F – Spearman's rho correlations

Table 23: Spearman' rho correlations for interpersonal trust and organisational innovativeness

Dimensions	LT – R	LT – C	LT – B	LT	VT – R	VT – C	VT – B	VT	CT	AT	CT & AT	PROD INN	BEH INN	STAT INN	PROC INN	INNO
LT – R	1.000	0.758	0.735	0.919	0.686	0.602	0.653	0.718	0.592	0.541	0.613	0.612	0.518	0.507	0.512	0.636
LT – C	-	1.000	0.746	0.922	0.600	0.614	0.539	0.634	0.611	0.613	0.699	0.590	0.484	0.507	0.490	0.604
LT – B	-	-	1.000	0.879	0.542	0.532	0.632	0.612	0.492	0.541	0.565	0.653	0.541	0.446	0.412	0.623
LT	-	-	-	1.000	0.672	0.646	0.665	0.723	0.644	0.629	0.695	0.672	0.563	0.526	0.516	0.679
VT – R	-	-	-	-	1.000	0.817	0.796	0.957	0.652	0.599	0.645	0.591	0.576	0.562	0.598	0.660
VT – C	-	-	-	-	-	1.000	0.729	0.895	0.524	0.535	0.587	0.548	0.617	0.636	0.602	0.674
VT – B	-	-	-	-	-	-	1.000	0.903	0.457	0.531	0.549	0.626	0.574	0.533	0.563	0.673
VT	-	-	-	-	-	-	-	1.000	0.562	0.597	0.643	0.641	0.629	0.602	0.627	0.717
CT	-	-	-	-	-	-	-	-	1.000	0.629	0.886	0.535	0.498	0.523	0.488	0.580
AT	-	-	-	-	-	-	-	-	-	1.000	0.912	0.630	0.518	0.461	0.463	0.619
CT & AT	-	-	-	-	-	-	-	-	-	-	1.000	0.646	0.556	0.536	0.524	0.661
PROD INN	-	-	-	-	-	-	-	-	-	-	-	1.000	0.654	0.589	0.584	0.840
BEH INN	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.663	0.709	0.905
STAT INN	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.694	0.815
PROC INN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.821
INNO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000

Abbreviation	Dimension	Abbreviation	Dimension	Abbreviation	Dimension	Abbreviation	Dimension
LT – R	Trust in employee reliability	VT – R	Trust in leader's reliability	CT	Cognitive trust	PROD INN	Product innovativeness
LT – C	Trust in employee competence	VT – C	Trust in leader's competence	AT	Affective trust	BEH INN	Behavioural innovativeness
LT - B	Trust in employee benevolence	VT - B	Trust in leader's benevolence	CT&AT	Cognitive & affective trust	STAT INN	Strategic innovativeness
LT	Overall co-worker trust	VT	Overall leaders trust			PROC INN	Process innovativeness
						INNO	Overall organisational innovativeness

Table 24: Spearman' rho correlations for interpersonal trust and organisational innovativeness in the co-worker group

Dimensions	LT – R	LT – C	LT – B	LT	VT – R	VT – C	VT – B	VT	CT	AT	CT & AT	PROD INN	BEH INN	STAT INN	PROC INN	INNO
LT – R	1.000	0.744	0.740	0.920	0.684	0.627	0.689	0.743	0.477	0.540	0.566	0.598	0.569	0.574	0.560	0.653
LT – C	-	1.000	0.755	0.923	0.646	0.624	0.595	0.684	0.643	0.636	0.720	0.641	0.548	0.604	0.611	0.664
LT – B	-	-	1.000	0.887	0.574	0.559	0.668	0.656	0.422	0.527	0.537	0.646	0.610	0.548	0.505	0.658
LT	-	-	-	1.000	0.698	0.664	0.705	0.761	0.567	0.630	0.671	0.679	0.634	0.631	0.603	0.724
VT – R	-	-	-	-	1.000	0.820	0.785	0.959	0.514	0.585	0.627	0.615	0.578	0.611	0.588	0.642
VT – C	-	-	-	-	-	1.000	0.698	0.892	0.486	0.488	0.548	0.590	0.656	0.719	0.615	0.684
VT – B	-	-	-	-	-	-	1.000	0.893	0.384	0.471	0.490	0.649	0.606	0.599	0.586	0.675
VT	-	-	-	-	-	-	-	1.000	0.506	0.562	0.607	0.672	0.655	0.669	0.634	0.714
CT	-	-	-	-	-	-	-	-	1.000	0.586	0.868	0.514	0.469	0.571	0.509	0.533
AT	-	-	-	-	-	-	-	-	-	1.000	0.902	0.647	0.552	0.529	0.541	0.643
CT & AT	-	-	-	-	-	-	-	-	-	-	1.000	0.659	0.568	0.614	0.601	0.675
PROD INN	-	-	-	-	-	-	-	-	-	-	-	1.000	0.757	0.655	0.697	0.878
BEH INN	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.694	0.726	0.924
STAT INN	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.707	0.830
PROC INN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.846
INNO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000

Abbreviation	Dimension
LT – R	Trust in employee reliability
LT – C	Trust in employee competence
LT - B	Trust in employee benevolence
LT	Overall co-worker trust

Abbreviation	Dimension
VT – R	Trust in leader's reliability
VT – C	Trust in leader's competence
VT - B	Trust in leader's benevolence
VT	Overall leaders trust

Abbreviation	Dimension
CT	Cognitive trust
AT	Affective trust
CT&AT	Cognitive & affective trust

Abbreviation	Dimension
PROD INN	Product innovativeness
BEH INN	Behavioural innovativeness
STAT INN	Strategic innovativeness
PROC INN	Process innovativeness
INNO	Overall organisational innovativeness

Table 25: Spearman' rho correlations for interpersonal trust and organisational innovativeness in the leadership group

Dimensions	LT – R	LT – C	LT – B	LT	VT – R	VT – C	VT – B	VT	CT	AT	CT & AT	PROD INN	BEH INN	STAT INN	PROC INN	INNO
LT – R	1.000	0.127	0.305	0.600	0.442	0.236	0.485	0.442	0.345	-0.262	0.180	-0.068	0.195	-0.045	0.506	0.120
LT – C	-	1.000	0.612	0.795	-0.157	0.602	0.123	-0.024	0.193	0.158	0.127	-0.259	-0.030	-0.096	0.168	0.036
LT – B	-	-	1.000	0.733	-0.133	0.455	0.056	-0.067	0.321	0.256	0.207	0.155	-0.012	-0.295	0.275	0.084
LT	-	-	-	1.000	0.133	0.639	0.358	0.235	0.241	0.115	0.103	-0.210	0.139	-0.191	0.311	0.084
VT – R	-	-	-	-	1.000	0.554	0.957	0.988	0.693	0.442	0.661	0.401	0.891	0.421	0.634	0.802
VT – C	-	-	-	-	-	1.000	0.729	0.645	0.639	0.673	0.697	0.420	0.600	0.242	0.336	0.683
VT – B	-	-	-	-	-	-	1.000	0.976	0.747	0.460	0.677	0348	0.907	0.458	0.701	0.847
VT	-	-	-	-	-	-	-	1.000	0.723	0.509	0.709	0.364	0.879	0.357	0.634	0.790
CT	-	-	-	-	-	-	-	-	1.000	0.564	0.885	0.593	0.624	0.217	0.758	0.766
AT	-	-	-	-	-	-	-	-	-	1.000	0.866	0.584	0.494	-0.090	0.125	0.542
CT & AT	-	-	-	-	-	-	-	-	-	-	1.000	0.683	0.616	0.096	0.469	0.735
PROD INN	-	-	-	-	-	-	-	-	-	-	-	1.000	0.379	0.294	0.096	0.638
BEH INN	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.610	0.669	0.916
STAT INN	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.316	0.698
PROC INN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000	0.630
INNO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.000

Abbreviation	Dimension	Abbreviation	Dimension	Abbreviation	Dimension	Abbreviation	Dimension
LT – R	Trust in employee reliability	VT – R	Trust in leader's reliability	CT	Cognitive trust	PROD INN	Product innovativeness
LT – C	Trust in employee competence	VT – C	Trust in leader's competence	AT	Affective trust	BEH INN	Behavioural innovativeness
LT - B	Trust in employee benevolence	VT - B	Trust in leader's benevolence	CT&AT	Cognitive & affective trust	STAT INN	Strategic innovativeness
LT	Overall co-worker trust	VT	Overall leaders trust			PROC INN	Process innovativeness
						INNO	Overall organisational innovativeness

Appendix G – Comparisons of trust and organisational innovativeness for the leadership & co-worker groups

Table 26: Comparisons of trust and organisational innovativeness for the leadership and co-worker groups

Dimension	Mean		Standard Deviation		p-value of t-test	Parametric effect size: Cohen's d-value	p-value of Mann-Whitney test	Nonparametric effect size
	Leaders	Co-worker	Leaders	Co-worker				
Trust in employee reliability	3.38	3.26	0.452	0.692	0.524	0.171	0.586	0.062
Trust in employee competence	3.43	3.52	0.752	0.778	0.744	0.122	0.778	0.032
Trust in employee benevolence	3.38	3.13	0.612	0.819	0.322	0.302	0.358	0.104
Overall co-worker trust	3.39	3.31	0.427	0.689	0.641	0.120	0.680	0.047
Trust in leader's reliability	3.42	3.12	0.661	0.907	0.281	0.353	0.395	0.096
Trust in leader's competence	3.55	3.42	0.563	0.784	0.576	0.162	0.678	0.047
Trust in leader's benevolence	3.47	3.10	0.839	0.897	0.268	0.415	0.114	0.179
Overall leaders trust	3.48	3.22	0.628	0.806	0.310	0.321	0.295	0.119
Cognitive trust	3.56	3.32	0.427	0.497	1.499	0.489	0.188	0.149
Affective trust	3.50	3.35	0.733	0.633	0.588	0.208	0.508	0.075
Cognitive & affective trust	3.53	3.33	0.518	0.504	1.045	0.389	0.258	0.128
Product innovativeness	3.20	3.15	0.302	0.724	0.737	0.065	0.759	0.035
Behavioural innovativeness	3.35	3.22	0.612	0.791	0.591	0.166	0.743	0.037
Strategic innovativeness	3.04	3.13	0.486	0.833	0.663	0.107	0.631	0.054
Process innovativeness	3.46	3.42	0.434	0.747	0.834	0.051	1.000	0.000
Overall organisational innovativeness	3.27	3.21	0.347	0.678	0.726	0.077	0.754	0.035