

The adaptation and evaluation of a measure of organizational culture in the mining
industry in South Africa

A Research Report

Presented to the

Graduate School of Business Leadership

University of South Africa

In partial fulfillment of the requirements for the
MASTERS DEGREE IN BUSINESS LEADERSHIP,

UNIVERSITY OF SOUTH AFRICA

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13 December 2011



ABSTRACT

The aim of this research was to adapt and evaluate a measure of organizational culture for use in the mining industry in South Africa. The importance of this study lies in the fact that norms for the measure of organizational culture in the mining industry are not currently available. This research document details the process that was followed to establish a list of items that would measure organizational culture. In order to do this, theories of organizational culture were studied. The knowledge gained from this process resulted in the Denison's Organizational Culture Survey being adapted to measure organizational culture in the mining industry. For the purpose of this study a quantitative methodology was adopted using opportunity sampling. The sample (n=147) was obtained from three mining companies.

The correlation between the individual items and the total score indicated that 4 items did not correlate meaningfully ($r < .6$) with the total scores on this measure. Furthermore, 8 items did not load on the factors as expected. Gender bias was not detected but 8 items demonstrated possible race bias. After evaluation of these issues, the decision was made to utilize the adapted questionnaire in its entirety. The reliability of the measure, as expressed by a Cronbach alpha of .93, was deemed acceptable. Sixteen correlations were determined to identify the impact of organizational culture on organizational commitment, employee engagement, job satisfaction and intention to quit. The relationships determined via this study were aligned with the literature findings and support for concurrent validity of the questionnaire was demonstrated. Notwithstanding the issues with possible race bias these positive results relating to concurrent validity suggest that the measure may be useful for application in the mining industry. The utility of the measure is supported by the acceptable reliability reported. Since only three mining companies were included in the sample, this measure should be used with caution. This limited number of companies included in the research limits generalization within the mining industry. Future research could expand on the number of companies in order to achieve wider generalization.

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Professor Renier Steyn, for his invaluable guidance, patience and support in this endeavor.

I am also grateful to my husband and children for the support and sacrifices they have made and for their unwavering encouragement and patience.

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CHAPTER 1: INTRODUCTION

This research is about the adaptation and evaluation of a measure of organizational culture in the mining industry in South Africa.

In this chapter the background to the study is presented, followed by the problem statement and the research goals. Next the context of the research will be discussed. This will be followed by a discussion of the research design and method, and the chapter will be concluded with a summary of the chapters that follow.

1.1 Background

A theory is a set of interrelated concepts, definitions, and propositions that present a systematic view of events or situations by specifying relations among variables, in order to explain and predict the events or situations. The extent to which theories are valid and fit the situation, are indicative of the successfulness of the theories' explanations and predictions. A theory is based upon a hypothesis and is backed by evidence. A theory presents a concept or idea that is testable. In science, a theory is not merely a guess. It is a fact-based framework for describing a phenomenon. In psychology, theories are used to provide a model for understanding human thoughts, emotions and behaviors (Trifiletti, Gielen, Sleet & Hopkins 2005).

A model is a generalized or hypothetical description used to analyze or explain something. The term model is used in business research to represent phenomena through the use of analogy. A model's purpose is to increase understanding, prediction and control of the complexities of environments. Descriptive, predictive and normative models are found in research. Descriptive models allow the visualization of variables and relationships. Predictive models forecast future events and normative models are used for control (Sachdeva 2009).

Models can perform two fundamentally different representational functions. On the one hand, a model can be a representation of a selected part of the world (the target system). Depending on the nature of the target, such models are either models of phenomena or models of data. On the other hand, a model can represent a theory in the sense that it interprets the laws and universally accepted principles of that theory (Frigg & Hartman 2006).

Theories and models are important since they assist in the focus on what is changeable and in identifying the most suitable areas or targets for change. Theories and models can be useful in planning, implementing and evaluating interventions. Theories and models help program planners and researchers go beyond basic unchangeable risk factors (e.g. gender, socioeconomic status) to answer why, how and what people can do to change their behavior. Theories and models can be used to guide the search for reasons for behaviour and help pinpoint what needs to be known before developing or organizing an intervention program. They can provide insight into how program strategies should be shaped to reach people and organizations and make an impact on them. They also help in the identification of what should be monitored, measured and compared in the program evaluation (Trifiletti *et al* 2005).

Measurement is the assignment of numbers to physical or mental objects, attributes, traits or constructs. The measurement process begins out with a predefined theoretical model of how the world looks. Data is then collected and statistical tests are performed to see whether the data fit the theoretical expectations of the theoretical model. If the data do not fit the model, then either the data are bad, or the theoretical model needs to be revised. Within the context of measurement, the theoretical models are falsifiable. (Stemler & Birney 2008)

Measurement is required to test theories in human resources management. The measurement of organizational culture is not undisputed or standardized for South Africa. Hence it is difficult to build models and theory in South Africa as the measurement of the construct is not optimized.

Theories, models, and measurement in human resources provide the ability to measure organizational culture and can help organizations and their managers to assess and examine organizational culture to improve performance. Also, a validated measure would provide a good foundation for useful studies that aim to relate organizational culture with other concepts of interest, e.g. innovation and knowledge management. If measuring organizational culture becomes possible then its influence on other organizational functions, like knowledge sharing, innovation and employee performance, can be empirically examined. It is very important that a concept that needs change be observable or even measured, otherwise it cannot be manipulated. Apart from the need for change, there is importance in relating this concept to other organizational activities such as productivity and quality, knowledge sharing and transfer, employee attitudes and working (Khan, Usoro & Majewski 2010).

1.2 Problem statement

Given the background, this research will offer guidelines on an instrument to measure organizational culture in the South African mining industry.

1.2.1 The importance of the research

For business - this research will present an instrument for the measurement of organizational culture within the South African mining industry.

For academia - Although the Denison Organizational Culture Survey has been applied to the financial (Davidson 2007) and health care industries (Zwaan 2006) in South Africa, this is the first application of the instrument to the South African mining industry.

On a personal level this research facilitates the understanding of the prevailing organizational culture prevalent in the South African mining industry.

1.3 Research goals

The research goals are divided into a general and (three) specific goals.

1.3.1 General goal

The specific goal of this research is the adaptation and evaluation of a measure of organizational culture in the mining industry in South Africa.

1.3.2 Specific goals

The specific goals are as follows:

- To report an understanding of organizational culture and how organizational culture relates to other concepts.
- To evaluate measurements of organizational culture.
- To administer a foreign questionnaire for organizational culture in the South African setting.
- To evaluate the questionnaire selected to measure organizational culture.
- To report on the effectiveness of the selected organizational culture questionnaire.

1.4 Context of the research

1.4.1 Disciplinary context of the research

This research is done within the context of business research. Business research can be defined as the systematic and organized effort to investigate a specific problem encountered in the work setting that needs a solution. The research provides the required information that guides managers to make informed decisions to successfully deal with problems (www.researchmethodology.info/definition-of-business-research/).

The field within business research is human resource management. Human resource management can be defined as “the design, implementation and maintenance of

strategies to manage people for optimum business performance including the development of policies and processes to support these strategies” (Mullins 2005, p747).

1.4.2 Meta theoretical assumptions

Meta theoretical assumptions can be defined as a form of rational inquiry that examines assumptions behind existing theories in order to achieve a deeper understanding of these theories or different theoretical perspectives. The meta-theoretical assumptions that determine different research perspectives are positivist, interpretivist and critical rationalism (Dubravka 2011).

The meta-theoretical assumption applicable in this research is that the research will primarily be approached from a critical rationalism perspective. The critical rationalism perspective aims to challenge and change established social institutions and conditions. Critical rationalism recognizes the progress of science as characterized by fallibilistic approach i.e., critical approach and demands empirical testability, which is one of trial and error.

With regard to the literature review, the approach will be from a hermeneutic perspective. Viewing literature review as a hermeneutic process makes it evident that there is no final understanding of *the* relevant literature, but a constant re-interpretation leading (ideally) to deeper and more comprehensive understanding of relevant publications. It argues that, especially in the social science and humanities literature, reviews are better understood as a continuing open-ended process where increased understanding of the research area and better understanding of the research problem inform each other. Hermeneutics is concerned with the process of the creation of interpretive understanding (Boell, Sebastian & Dubravka 2010).

1.4.3 Models and theories

Gelso (2006) presents that a theory may be thought of as two or more constructs or variables, which have been hypothesized, assumed, or even factually demonstrated to be related to each other.

A further definition of a theory is that it is a collection of both verbal and symbolic assertions that identifies the reasons why variables are important, specifies how and why they are interrelated, and identifies the conditions under which they should be related or not related (Weick n.d.).

A model is defined as a schematic representation of a system, theory, or phenomenon that accounts for its known or inferred properties and may be used for further study of its characteristics (<http://www.thefreedictionary.com/model>).

The definition above presents the idea that a model is a representation of something for purposes of study, or a design for realizing something new.

A model 'of' exists to tell us that we do not know, and the model 'for' to give us what we do not yet have (McCarty 2004).

The models and theory applicable in this research are Hofstede's national culture theory (1980), Schein's (1985) organizational theory and model of culture and Denison's (1990) organizational culture model.

1.4.4 Delimitations

This research will only focus on the design and evaluation of a measure of organizational culture in the mining industry in South Africa.

It is acknowledged that this research will not focus on the measurement of organizational culture in any industry other than the mining industry.

1.4.5 Limitations of this study

This research was conducted only among three mining companies. The results are based on an opportunity sample since the participating organizations were not identified through a randomization process. The researchers accessed respondents in the environment where they are employed. Certain groups may thus have been under-represented.

The selected instrument – the Denison Organizational Culture Survey, was designed and validated in America only. South African studies have been limited to the financial and health care industries, thus no validation exists for the mining industry. The items of the instrument may also be invalid for the South African mining population.

1.5 Research design

Questionnaires will be used to collect data. A questionnaire is a form containing a set of questions, addressed to a statistically significant number of subjects as a way of gathering information for a survey in order to collect statistical information (www.thefreedictionary.com/questionnaire).

A cross-sectional research design was used. This design is suitable for describing the population as well as the calculation of correlations between measured constructs (Shaughnessy, Zechmeister & Zechmeister 2009). The design suits this research effort well as this research is primarily descriptive and relational.

1.6 Research method

The research consists of a literature review and an empirical investigation.

1.6.2 Literature review

Textbook and journals served as the primary source for the literature review.

The steps taken in the literature review were as follows:

- Step 1: Define the concept from several perspectives. The goal in this part of the research was to come to a thorough understanding of what is meant when this word is used and to describe how it will be used in this research. This relates to conceptual validity of the proposed measure.
- Step 2: Describe how the concept relates to other variables. In this part the theories and models regarding the concept were presented. This information was used as a basis to make comments regarding the concurrent, discriminate and possible predictive validity of the proposed measure.
- Step 3: Compile several lists of the elements, if any, of which the concept comprises. Here the objective was to identify the building block of the concept. The goal was to find the elements that needed to be included in the measure. This relates to the construct validity of the measure.
- Step 4: Write notes on the validity and reliability of a psychometric measure, and the characteristics of a good measure and its items.
- Step 5: List measures and describe the measures of the concept. The idea in this section was to find a measure that can be possibly used in the local context or model items to be included in a new measure.
- Step 6: Describe how the measures relate to the elements of the concept. With Step 6 the measures found were evaluated for construct validity. This entailed revisiting Step 3.
- Step 7: Describe how the measured concept relates to other variables. With Step 7 information regarding criterion-related validity of the existing measures was searched for. Here the intention was to find journal articles that indicate the theoretical explanations are supported by empirical findings.
- Step 8: Suggest the selected measure or pool of items to be considered as a measure of the concept.

The literature review set the stage for the empirical investigation.

1.6.3 Empirical investigation

The empirical investigation will be discussed with reference to the steps that will be undertaken in the research, followed by an explanation of the sampling plan, the measuring instruments, and the statistical techniques that will be applied.

1.6.3.1 Steps of the empirical investigation

The empirical investigation will consist of ten steps:

- Step 1: Continuing from the literature review, compile, after consultation with the fellow students and the study leader, a list of items to be to be tried out in the empirical investigation.
- Step 2: Compile a battery which include items of this concept and combine that with other questionnaires. The idea was that when several measures were included in a battery, information on concurrent, discriminant, and factorial validity can be collected.
- Step 3: Send the battery to a language editor and ask him / her to make specific comments on face validity. This allowed for the linguistic modification of the questionnaire as well as adjustments regarding the face validity thereof.
- Step 4: Decide on a suitable population to administer the battery on in order to determine its psychometric characteristics. Sample selection is discussed in greater detail in section 1.6.2.2.
- Step 5: Gain consent from the participants and administer the battery. All participation was voluntary and the participants were informed about their rights as participant and the purpose of the research. Consent forms were handed to each participant (see Annexure A).
- Step 6: Capture the data on an Excel spreadsheet. This was done in groups of two students in order to eliminate punching errors.

- Step 7: Eliminate items based on their low correlation with construct (correlation matrix) or factor (factor analysis), and high levels of gender and race bias. This was done in consultation with the study leader.
- Step 8: Determine reliability of the shortened questionnaire. The reliability of the shortened questionnaire was expressed as a Cronbach alpha coefficient.
- Step 9: Determine the correlation between (the cleaned up) measured concept and other concepts measured and identified in the literature review. Evidence regarding convergent and discriminate validity was created in this manner. Since the organizational culture concept theoretically consists of subcomponents, factor analysis will be done to report on the factorial validity of the shortened measure.
- Step 10: Discuss the utility of the questionnaire for future use. Here the evidence gathered regarding the reliability and validity of the questionnaire was presented.

SPSS software will be used to do all the calculations.

1.6.2.2 Sample

Several organizations will be targeted to obtain respondents to participate in this research. These are Lonmin, Sasol Mining and Exxaro Resources. The organizations targeted were selected because of easy access to them. The fact that the participating organizations were not identified through a randomization process, but that the researchers accessed respondents in the environment where they are employed, make this an opportunity sample (Rosnow & Rosenthal 2008). Once the organizations were identified, a random sample was drawn from the all possible respondents within the organization. This process is discussed in full in section 3.3. The aim was to draw a sample of 50 respondents per organization.

1.6.2.3 Measuring instruments

In this research seven of the newly developed (of the foreign to the South African content) instruments were used with three established ones.

1.6.2.4 Statistical techniques

The first group of techniques was used to eliminate weak items. The selection of items was firstly guided by the correlation between the individual item score and the total score on the proposed measure. Then factor analysis was used to identify items that did not load significantly on the extracted factor. Finally, multivariate analysis of variance was used to determine gender and race bias in items, and based on this, further items were eliminated. After eliminating weak items, the reliability of the questionnaires, as expressed with the Cronbach's coefficient alpha, was computed. Only thereafter the correlations with other measures were calculated. All these calculations were done with SPSS.

1.7 Summary of chapters that follow

Chapter 2 presents a review of the relevant literature. The literature review focuses on theories and models conceptualized by Hofstede, Schein and Denison. Hofstede's (1980) national culture theory classified a country's cultural attitudes into five dimensions. These are power distance, uncertainty avoidance, Individualism versus Collectivism, Masculine versus Feminine and Time Orientation/Confucian Dynamism. Schein's (1985) organizational theory and model of culture refers to cultural elements such as the physical layout of an organizations offices, rules of interaction that are taught to newcomers, basic values that come to be considered as the organization's philosophy, and the underlying conceptual categories and assumptions that enable communication and interpretation of everyday occurrences. Schein's model distinguishes between these elements by treating basic assumptions as the culture essence (what culture is) and by treating values and behaviors as observed manifestations of the cultural essence. The literature review concludes with a specific

focus on Denison's organizational culture model as the research is based on this model. The four dimensions of culture as set out in Denison's (1990) model of organizational culture, comprising of Involvement, Consistency, Mission and Adaptability, is presented and discussed.

In Chapter 3 the method of the research is discussed. In this chapter the research design and procedure is presented. Sample collection is discussed and a detailed description of the questionnaires that were used is presented. To conclude the chapter the selected statistical procedures are discussed, with specific reference to decision-making.

Chapter 4 presents the research results. The chapter focuses on a discussion of the sample followed by an overview of the results based on the statistical analysis. The correlations between the individual items and the total score of the measure are presented followed by the determination of the factor loadings of the individual items on the latent construct inherent to the measure. The results on an analysis of variance procedure, aimed at detecting gender and then race bias in the individual items of the organizational culture questionnaire is provided. The results on the four aforementioned analyses are integrated in order to facilitate the decision-making regarding eliminating items from the original questionnaire. The chapter concludes with the descriptive statistics and presents the correlation between the total scores of the organizational culture questionnaire on the one side, and job satisfaction, employee engagement, organizational commitment and intention to quit, on the other.

In Chapter 5 the findings of the study are discussed, and conclusions are drawn from the results. This is followed by several recommendations. The chapter concludes with the limitations of the research and recommendations for possible future research are discussed.

CHAPTER 2: LITERATURE REVIEW

2.1 Defining Organizational Culture

Since the early 1980s organizational culture as a concept has become increasingly popular (Denison & Fey 2003). Despite the growing interest in the topic, there seems to be little agreement within the literature as to what 'organizational culture' actually constitutes (O'Reilly, Chatman & Caldwell 1991) and, therefore, different definitions and perspectives on this topic abound.

Different concepts of culture, stemming from two distinct disciplines (anthropology and sociology), have been applied to organizational studies since the early 1980s. Anthropology takes the interpretivist view and regards culture as a metaphor for organizations, defining organizations as being cultures. On the other hand, sociology takes on the functionalist view, and defines culture as something an organization possesses (Sanchez-Canizares, Munoz, & Lopez-Guzman 2007).

The most widely used organizational culture framework is that of Edgar Schein (2004) who adopts the functionalist view describing culture as "the pattern of shared basic assumptions - invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration - that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (Schein 2004, p17).

Smircich (1983) indicates that in a particular situation the set of meanings that evolve gives a group its own ethos, or distinctive character, which is expressed in patterns of belief (ideology), activity (norms and rituals), language and other symbolic forms through which organization members both create and sustain their view of the world and their image of themselves in the world. The development of a worldview with its shared understanding of group identity, purpose and direction is a product of the unique history,

personal interactions and environmental circumstances of the group. This worldview is the organizational culture of the group.

Wheelen & Hunger (2010) published a definition of corporate culture, which is based on Schein's 1992 work, as "the collection of beliefs, expectations, and values learned and shared by a corporation's members and transmitted from one generation of employees to another" (p. 149).

Denison (1990, p.2) presents the following as the definition of organizational culture: "Organizational culture provides the underlying values, beliefs and principles that serve as a foundation for an organization's management system, as well as the set of management practices and behaviors that both exemplify and reinforce those basic principles. These principles and practices endure because they have meaning to the members of an organization."

According to Hofstede (1991), "culture is the collective programming of the human mind which distinguishes the members of one organization from another" (p180). The key term in the definition is the term 'programming'. Culture is not something that is easily acquired but is a slow process of growing into a society. It includes:

- learning values (dominant beliefs and attitudes),
- partaking of rituals (collective activities),
- modeling against heroes (role models), and
- understanding symbols (myths, legends, dress, and lingo)

Despite the various definitions and perspectives on organizational culture, one thing is universal among most of them, and that is the shared nature of the beliefs, philosophies, and norms which depict the dominant culture.

2.2 Theories and models of organizational culture

Textbooks served as the primary source of these theories and models regarding organizational culture. This section presents the organizational theories and models conceptualized by Hofstede, Schein and Denison.

2.2.1 Hofstede's national culture theory

In the mid 1970's, Geert Hofstede, based his five dimensions of culture on an extensive research program involving IBM employees based in 40 countries. With this program, he investigated the influence of national culture on corporate culture (Hofstede 1980).

Hofstede classified a country's cultural attitudes into five dimensions:

a) Power Distance

This refers to the extent to which power is distributed equally within a society and the degree to which that society accepts this distribution. A high power distance culture prefers hierarchical bureaucracies, strong leaders and a high regard for authority. A low power distance culture tends to favor personal responsibility and autonomy. According to Hofstede, this characterization of levels of inequality in organizations will depend on:

- Management style
- Willingness of subordinates to disagree with superiors
- The education level and status associated with particular roles (Mullins 2005)

b) Uncertainty avoidance

This dimension refers to the degree to which individuals require set boundaries and clear structures: a high uncertainty culture allows individuals to cope better with risk and innovation; a low uncertainty culture emphasizes a higher level of standardization and greater job security. It focuses on the level of tolerance for uncertainty and ambiguity within the society. A High Uncertainty Avoidance ranking indicates the country has a

low tolerance for uncertainty and ambiguity. This creates a rule-oriented society that institutes laws, rules, regulations, and controls in order to reduce the amount of uncertainty. A Low Uncertainty Avoidance ranking indicates the country has less concern about ambiguity and uncertainty and has more tolerance for a diversity of opinions. This is reflected in a society that is less rule-oriented, more readily accepts change, and takes greater risks

c) Individualism versus Collectivism

This dimension describes the degree to which individuals base their actions on self-interest versus the interests of the group. In an individual culture, free will is highly valued. In a collective culture, personal needs are less important than the group's needs.

d) Masculine versus Feminine

This dimensional aspect refers to the difference between masculine characteristics and typical female traits. In a masculine society there is a division of labor in terms of which the more assertive tasks are given to men. Emphasis is placed on academic success, competition and achievement in careers. In a feminine society the emphasis is on relationships, compromise, life skills and social performance. This measure depicts society's goal orientation: a masculine culture emphasizes status derived from wages and position; a feminine culture emphasizes human relations and quality of life.

e) Time Orientation/Confucian Dynamism

This dimension was originally referred to as the Confucian work dynamism. It refers to the degree to which a society does or does not value long-term commitments and respect for tradition. The Confucian dynamism dimension developed from Hofstede's research with Michael Bond (1988) was meant to explain the rapid economic development of many Asian countries. This dimension refers to the selective promotion of a particular

set of ethics found in Confucian teachings. Particular teachings that lead to economic development include thrift, a sense of shame and following a hierarchy. Other Confucian teachings that are less emphasized are tradition and saving face. Countries with a long term time orientation exhibit concern for both traditions and the impact of their actions on future generations (Hofstede & Bond 1998).

Hofstede (1991) maintained that organizational cultures should be distinguished from national cultures. Cultures manifest themselves in symbols, heroes, rituals and values. Hofstede maintained that national cultures differed primarily on the values levels. Organizational cultures on the other hand, differed at the practice level which consists of symbols, heroes and rituals that are externally visible.

A study conducted by Hofstede, Neuijen, Ohayv and Sanders (1990) found that differences could be rated by variances on six independent dimensions:

- a) Process-oriented vs. results-oriented:
In a process-oriented organization the procedure of dealing with everyday work is viewed as the most important thing, whereas in a result-oriented organization, the employees' performance is evaluated only by the final result. There is no concern for the means by which the result is achieved.
- b) Employee-oriented vs. job-oriented:
In employee oriented organizations, important decisions are made by employees. Managers in job-oriented organizations allocate good employees to their own departments and exhibit low concern for personal problems of employees.
- c) Parochial vs. professional:
In parochial organizations, the employee's identity is derived from the organization to which they belong. In professional organizations, the employees' identity is determined according to the type of job they perform.

d) Open system vs. closed system:

This dimension describes the communication environment of the organization. Employees in open system organizations cooperate with each other and exchange information between them. New employees are able to fit into their work environment easily with the help of senior organization members. In closed systems information is closely guarded and new employees take a long time to fit in.

e) Loose vs. tight control:

This dimension refers to the internal structuring in an organization. Loosely controlled organizations exhibit no strict rules and procedures to guide employees' behavior. This type of organization is adaptable and can change easily. In tightly controlled organizations, employees need to abide by rules and procedures, as determined by the organization.

f) Normative vs. pragmatic:

Pragmatic organizations have a market driven culture. In normative organizations their mission towards the external environment is the implementation of "unbreakable regulations" (Liu 2006, p19).

Hofstede *et al* (1990) classified the manifestation of culture into four categories, namely symbols, heroes, rituals and values. Symbols are words, gestures, pictures or objects recognized by those who are part of the same organizational culture. Heroes are persons who possess characteristics highly prized in the culture and who thus serve as models for behavior (Hofstede 1985). Rituals are collective activities that are superfluous in reaching desired ends but are socially essential within a culture. Hofstede (1980) describes these layers as being similar to the successive skins of an onion: from shallow superficial symbols to deeper rituals. Symbols, heroes and rituals can be termed practices because they are visible to an observer, although their cultural meaning lies in the way they are perceived by insiders. The core of culture is formed by values that are often unconscious. These values cannot be observed as such, but are manifested in alternatives of behavior (Hofstede *et al* 1990).

2.2.2 Schein's organizational theory and model of culture

In Schein's (1985) discussion of organizational culture, he refers to cultural elements such as the physical layout of an organizations offices, rules of interaction that are taught to newcomers, basic values that come to be considered as the organization's philosophy, and the underlying conceptual categories and assumptions that enable communication and interpretation of everyday occurrences. In his model presented in figure 2.1 below, Schein distinguishes between these elements by treating basic assumptions as the culture essence (what culture is) and by treating values and behaviors as observed manifestations of the cultural essence. Schein's organizational model of culture is depicted from the standpoint of the observer, and is described by three cognitive levels of organizational culture.

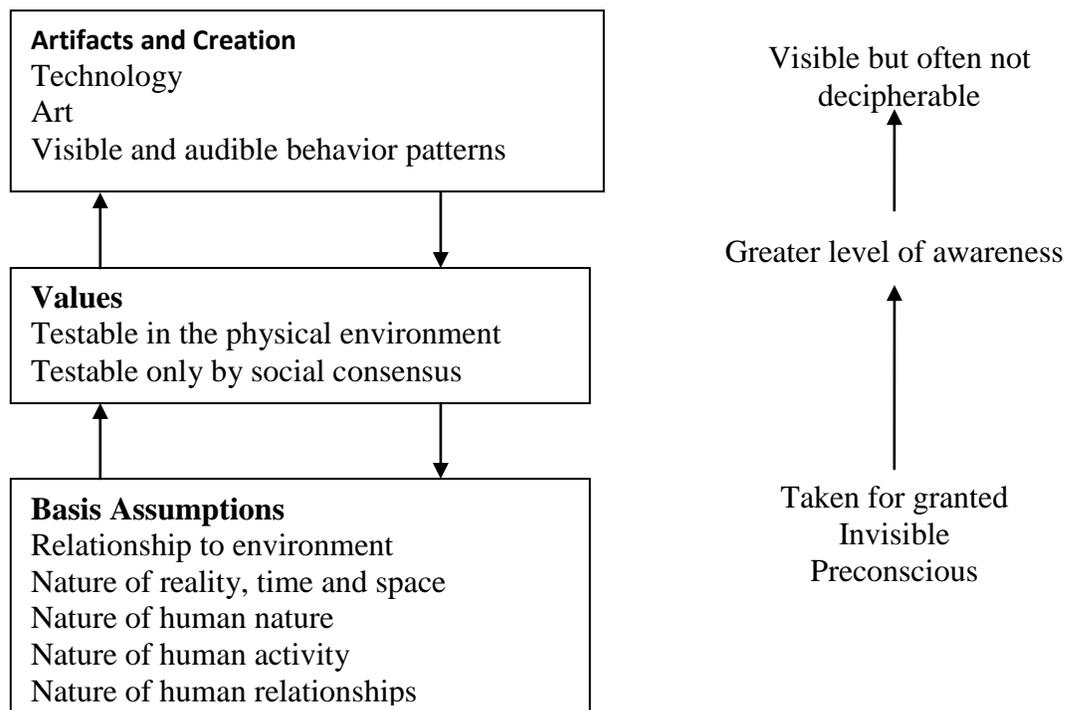


Figure 2.1 Levels of culture and their interaction

Source: Schein, 2004

As reflected in figure 2.1, Schein (2004) differentiates between the elements of culture by treating basic assumptions as the essence or the core of culture, and values and behaviors as observed manifestations of the cultural essence. He contends that these are levels of culture and that they should be carefully distinguished in order to avoid conceptual confusion.

Level 1: Artifacts

The most visible level of culture is its artifacts and creations, consisting of its constructed physical and social environment. These are the tangible aspects shared by members of an organizational group, including verbal, behavioral and physical attributes. Also included, are things such as the language, stories and myths, rituals, symbols and ceremonies, technology and art used by an organization. From the standpoint of the uninitiated observer, it is easy to observe artifacts but it is difficult to figure out what they mean, how they interrelate and what deeper patterns, if any, they reflect (Schein 2004).

Level 2: Values

Values are the evaluation base that members of an organization use for judging the 'rightness' or 'wrongness' of situations, acts, objects and people. When a group is first created, or when it faces a new task or a new problem, the solution proposed to deal with it is a reflection of someone's perception of the correct way to deal with it. In a sense, all cultural learning ultimately reflects someone's original values, usually the founder of the organization. If the solution works and the group has a shared perception of that success, the value gradually starts a process of cognitive transformation into a belief and, ultimately, an assumption. According to Schein (2004), beliefs and values at this conscious level will predict much of the behavior at the artifacts level. However, if these beliefs are not based on prior learning, they reflect what people will say in situations but these may be incongruent with what they will actually do in situations in which these values and beliefs should be operating. As values

and beliefs become assumptions, they drop out of consciousness. However, many values remain conscious and are explicitly articulated, because they serve as the moral function of the guiding members of the group in how to deal with certain situations (Schein 2004).

Level 3: Basic Underlying Assumptions

When a solution to a problem works repeatedly, it becomes taken for granted. What was once a hypothesis, supported only by a hunch or a value, is gradually treated as a reality. Culture, as a set of basic assumptions, guides behavior, defines what to pay attention to, how to react emotionally to situations, and what actions to take in these situations (Schein 2004). Basic assumptions become taken for granted to the extent that little variation will be found within a cultural unit (Schein 1985). Basic assumptions are not generally confronted or debated, are extremely difficult to change and can have the potential to distort data in certain situations.

Schein's research articulated a conceptual framework for analyzing and intervening in the culture of organizations from which other researchers, (Quinn & Rohrbaugh 1983, Denison 1990) built their own organizational theories (Hatch 1993). It provided the framework for researchers to identify the specific culture characteristics, which range from behavioral norms to underlying beliefs within organizations (Liu 2006).

2.2.3 Denison's Organizational Culture Theory and Model

In his book, *Corporate Culture and Organizational Effectiveness*, Denison (1990) developed a theory of organizational culture and effectiveness. He identified four views of organizational culture that he translated into four hypotheses:

- The involvement hypothesis pertains to the notion that high levels of involvement and participation will contribute to a sense of responsibility and ownership resulting in greater commitment to an organization

- The consistency hypothesis purports that, a common perspective; shared beliefs and communal values among organization members will enhance internal coordination, and promote meaning and a sense of identification to organization members.
- The adaptability hypothesis holds that norms and beliefs that support an organization's ability to receive, interpret and translate signals from the environment into internal organizational and behavioral changes will promote its survival, growth and development.
- The mission hypothesis is premised on the idea that a shared sense of purpose, direction and strategy can coordinate and structure behavior towards collective goals.

Taken individually, these hypotheses represent cultural determinants of performance and effectiveness. Denison integrated these four hypotheses into a single framework and specified the interrelationships between them.

In describing a theory of the culture/effectiveness relationship, Denison considered four major cultural aspects as identified above: involvement, consistency, adaptability, and mission. According to Denison (1990), involvement and consistency focus on the internal dynamics of an organization, while adaptability and mission focus on the relationship between the organization and its external environment. Denison argues that effectiveness can be viewed as a function of (1) the values and beliefs held by an organization's members; (2) the policies and practices used by an organization; (3) the translation of core values and beliefs into policies and practices in a consistent manner, and (4) the interrelationship of core values and beliefs, policies and practices, and the business environment of the organization. He suggested that an integrative model, taking into account the four cultural aspects along with a focus on change, flexibility, stability, and direction, allows us to better understand and predict the impact an organization's culture will have on effectiveness. Denison proposed that the framework thus developed, could be used as a set of lenses through which organizational culture can be viewed.

Denison (1990) observes that effective organizations are often faced with reconciling conflicting demands. For example, change and flexibility are often at odds with stability and organizational direction even though, in reality, these four cultural characteristics occur simultaneously.

Denison utilized Schein's (1985) theory of the three levels of culture with the external versus internal dimension and the flexible versus controlled environment proposed by Quinn and Rohrbaugh (1983) to develop a model and corresponding survey to research the relationship between culture and organizational effectiveness (Denison & Mishra, 1995).

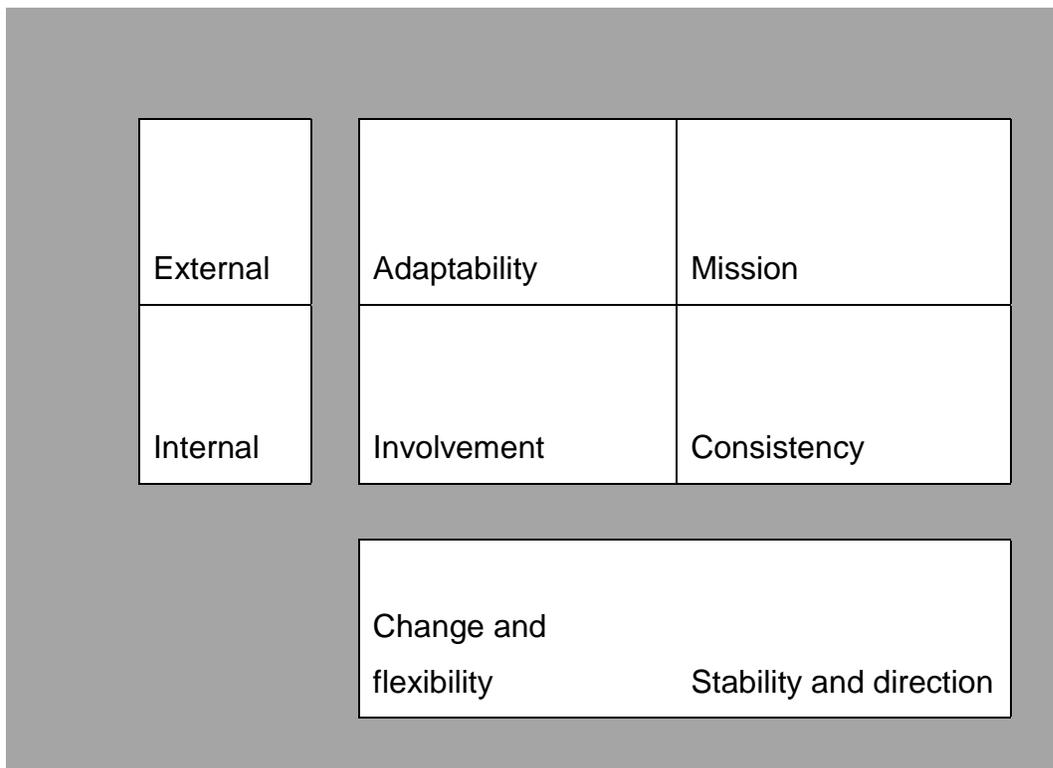


Figure 2.2 Denison's culture and effectiveness model

Source: Denison (1990, p. 15).

Figure 2.2 illustrates the integration of the four traits of involvement, consistency, adaptability and mission. In the model, involvement and consistency address the internal organization dynamics, but not the organization's interaction with the external

environment. The focus of adaptability and mission is on the relationship between the organization and the external environment. Hence the two pairs are:

Involvement and Consistency – dimension of internal focus

Adaptability and Mission – dimension of external focus (Denison 1990)

A further division of the elements of involvement, consistency, adaptability and mission reveals that involvement and adaptability form one pair, emphasizing the organization's capacity for flexibility and change. The orientation of consistency and mission is toward stability. A comparison of the different orientations within an organization reveals that;

- A focus on adaptability and involvement results in more variety, more input and more possible solutions to problems.
- A focus on consistency and mission results in reduced variety and higher emphasis on control and stability (Denison 1990).

Denison (1990) contends that, in line with the observations of contingency theorists, a control and stability orientation is best suited to an organization that already has an established set of responses to a situation within a stable environment. Denison (1990), notes that although each of the four concepts in his framework represents a separate path by which an organization's culture may have a positive impact of effectiveness, some are part contradictory. Involvement and adaptability describe traits related to an organizations flexibility or ability to change, whereas consistency and mission are more likely to contribute to an organization's capacity to remain stable and predictable over time. Instead of contending that the classification of an organization's culture must be an either/or type of decision, this framework assumes that an effective culture should provide all of these elements. Figure 2.2 shows the high-level traits, but does not show the underlying management practices and values.

The Denison's (1990) model of organizational culture (see figure 2.3 below) was based on eighteen years of research on organizations of various sizes and in different sectors of industries within the USA. It represents the interrelations of an organization's culture,

its management practices, its performance and its effectiveness. The model highlights the importance of linking management practices with underlying assumptions and beliefs when studying organizational culture and effectiveness. According to Schmidt, Gillespie, Kotrba Ritchie & Denison (n.d) the four dimensions of culture comprising the Denison Model (Involvement, Consistency, Mission and adaptability) are consistent with Schein's (1985) notion of culture. An organization's basic beliefs and assumptions form the center of Denison's organizational culture model. Denison's (1990) definition of organizational culture incorporated and built on these assumptions, providing greater emphasis on measurable behavior. The values and beliefs of an organization give rise to a set of management practices, which are concrete activities usually rooted in the values of the organization. These activities stem from and reinforce the dominant values and beliefs of the organization. Denison, Janovics, Young & Cho, (2006) identified four key cultural traits:

- **Involvement.** This trait consists of building human capability, ownership and responsibility. Organizational cultures characterized as highly involved cultures strongly encourage employee involvement and create a sense of ownership and responsibility. They rely on informal, voluntary and implicit control systems, rather than formal, explicit, bureaucratic control systems (Denison 1990). Involvement relates to the development of an employee as a whole person, i.e. capability, belief, ownership and accountability. It is thus a measure of the organization's participative nature and the focus placed on employees' development and involvement, i.e. a measure of employee engagement. The following dimensions are relevant:
 - **Empowerment:** Relates to the authority, initiative and ability delegated to employees to manage their own work. This fosters a sense of ownership and responsibility toward the organization;
 - **Team Orientation:** This aspect relates to the extent to which cooperation and collaboration is valued. In high performance and innovative cultures value is attributed to working cooperatively toward common goals for which all employees feel accountable for.

- **Capability Development:** The organization continually invests in the development of employees' skills in order to maintain competitive positioning, thereby facilitating the attainment of organizational goals.
- **Consistency.** Consistency provides a central source of integration, coordination and control. Consistent organizations develop a mindset of organizational systems that create an internal system of governance, based on consensual support (Denison 1990)

This trait relates to the degree of cohesion within an organization (Denison 1990). Behavior is embedded in a set of core values that guide leaders and organization members in reaching agreement and incorporating diverse points of view. Through this system of implicit control, achieving coordination and integration is more effective than if organizations had to rely on external systems based on explicit rules and regulations. This trait can be described as the so-called glue that keeps everything together. It is what ensures stability. The following, then, are its dimensions:

- **Core Values:** Members share a clear set of values that create a sense of identity and a clear set of expectations. Shared values are the essence of organization's philosophy for attaining success. Core values are things that members hold as important and the way to go about things in an organization. Values need to be clear as vagueness could lead to deviance. Values are also ways of creating meaning in the workplace.
- **Agreement:** Members of the organization are able to reach agreement on critical issues. This includes both the underlying level of agreement, and the ability to reconcile differences when they occur.
- **Coordination and Integration:** Different functions and units of the organization are able to work together to achieve common goals. Organizational boundaries do not set limitations on the work that needs to be done. Collaboration as one of the cornerstones of innovation and high performance spans across departments and functions. It is thus critical to

ensure that culture is not constrained by boundaries and that a free flow of information is encouraged.

- **Adaptability.** Adaptability is the ability to translate the demands of the business environment into action. Organizations hold a system of norms and beliefs that support the organization's capacity to receive, interpret and translate signals from its environment into internal behavior changes that increase its chances for survival and growth (Denison 1990). Lawrence and Lorsch (1967), as cited by Denison *et al* (2006), maintain that internal integration and external adaptation can be at odds with each other. Adaptable organizations translate the demands of the organization's environment into action. They take risks and learn from their mistakes, and have the capacity and experience to create change. They are continuously improving the organization's ability to provide value for its customers by creating a system of norms and beliefs that support the organization's capacity to receive, interpret and translate signals from its environment into internal systems that increase the organization's chance for survival and growth. The dimensions of adaptability are:
 - **Creating Change:** The organization is able to create adaptive ways to meet changing needs. It is able to read the business environment, react quickly to current trends, and anticipate future changes.
 - **Customer Focus:** External stakeholders are critical to high performance cultures and the level at which organizations are skilled to serve and anticipate future needs, is an important success factor. This dimension reflects the degree to which the organization is driven by a concern to satisfy its customers.
 - **Organizational Learning:** The organization receives, translates and interprets signals from the environment into opportunities for encouraging innovation, gaining knowledge and developing capabilities. Innovation is heavily reliant on the ability of an organization to learn and understand its environment in order to identify and exploit opportunities and threats.

- **Mission.** This trait pertains to the definition of a meaningful long-term direction for the organization by defining a social role and external goals for the organization. It provides a clear direction and goals that serve to define an appropriate course of action for an organization and its members (Denison 1990). A sense of mission allows an organization to shape current behavior by envisioning a desired future state.

According to Denison, Mission comprises the following three dimensions:

- **Vision:** Relates to the shared view of the future state. Vision is what the organization aspires to. It is an embodiment of core values and embeds itself into the organizations members to provide guidance and direction.
- **Strategic Intention and Intent:** Clear strategic intentions convey the organization's purpose and *what* and *how* an organization will contribute.
- **Goals and Objectives:** Are aligned with the strategy and vision and mission and provide members of an organization with clear direction in their work.

The abovementioned dimensions are underpinned by the sets of beliefs and assumptions in the organization, and are seen to be the centre link between the four traits. The model captures the paradoxes that companies constantly need to balance. The first paradox pertains to consistency versus adaptability in terms of which a culture which has very strong beliefs and processes might be very consistent and stable, but the culture lacks the flexibility to sense the need for change which is critical in an ever changing world. The second paradox is the one that is to be found in the mission versus involvement equation, which basically relates to the amount of participation in an organization, an aspect companies sometimes tend to underestimate, giving a lot of top-down direction but with little involvement from the organization. The model then is also a good measure of balance within the organization.

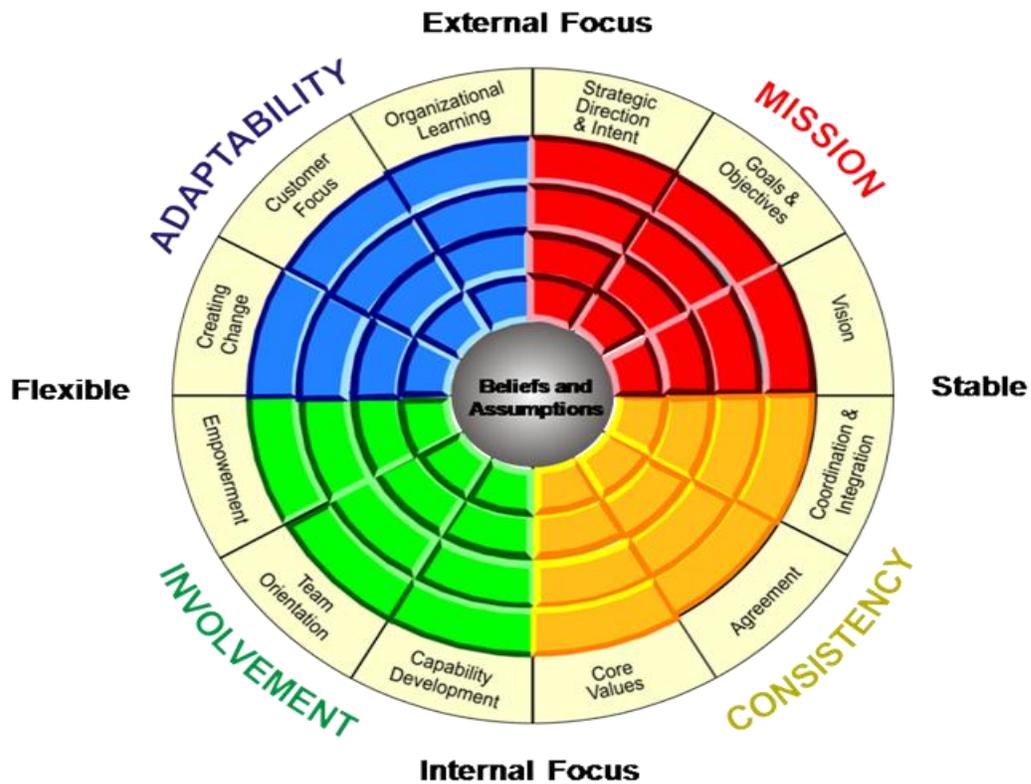


Figure 2.3 Denison's model of organizational culture

Source: www.densionconsulting.com

As asserted by Denison *et al* (2006), Schein's (1985) three levels of organization culture are incorporated into the center of Denison's Organizational Culture Model circumplex, which encompasses the values, beliefs, and meanings that underlie a social system as the primary source of motivated and coordinated activity. In addition, Denison *et al* (2006) maintained that the internal integration versus external adaptation tension (from Lawrence and Lorsch 1967 in Denison *et al* 2006)) is incorporated into the Denison's organizational culture model as one of the model's two dimensions. The Denison Model also incorporates Quinn and Rohrbaugh's (cited in Denison *et al* 2006) control and flexibility dimension. The Competing Values four quadrants - open systems model, rational goal model, internal process model, and human resources model - are renamed and incorporated into Denison's model. The Competing Values' open systems model is similar to Denison's mission trait, while the Competing Values rational goal model is similar to Denison's consistency trait. The Competing Values internal process model is

similar to Denison's involvement trait, while the Competing Values human resources model is similar to Denison's involvement trait.

Denison's Organizational Culture Model (Denison *et al* 2006) is preferred because it is the product of an organizational culture researchers' work (i.e., Schein's Organizational Culture Model 1985; Quinn & Rohrbaugh 1983; Quinn 1988).

2.3 Elements of Denison's Organizational Culture Model

For the purposes of this research, the Denison Organizational Culture Model was adapted to determine measures for organizational culture in South African organizations. The reason for its selection is that the Denison's Organizational Culture Survey has been used in several settings and reliability and validity studies have been conducted on the instrument (Cho 2000). Its applicability has been established in Russia (Denison & Fey 2003) and in Iceland (Gudlaugsson & Schalk 2009).

The Denison's Organizational Culture Survey has been validated by Cho (2000) and in South Africa by Davidson (2006). It is readily available at little or no cost to the researcher. The Denison Organizational Culture Survey has been utilized as discussed below.

- Based on earlier studies in the US, Fey and Denison (2003) further tested their results using the Denison Organizational Culture Survey. They conducted a quantitative study among 179 foreign owned firms operating in Russia, and found that the factor analysis demonstrated good convergent and discriminant validity.
- In 2006, a study by Denison *et al*, *Diagnosing Organizational Cultures: Validating a model and method*, was undertaken, using responses from 34 474 individuals in 160 organizations. This study presented a statistical validation of the items used in the survey to measure the key constructs of the Denison Organizational Culture model. This study found support for the reliability and validity of the Denison's Organizational Culture Survey.

- The Denison Organization Culture Model was used in studies conducted by Davidson (2007) to establish the relationship between organizational culture and effectiveness in the in the South African Western Cape Banking industry. The finding showed high ratings for empowerment. These ratings were attributed to the fact that employees had the authority and initiative to manage their work (Davidson 2007). Davidson (2007) concluded that the survey items had acceptable reliabilities.
- The Denison Organizational Culture Model was tested for reliability by Franck (2005) in a South African financial environment. Franck's study found support for the reliability of the Denison Organizational Culture model demonstrated.
- Liu (2006) conducted a study into the relationship between organizational culture and effectiveness in the South African Western Cape banking industry, using the Denison Organizational Culture Model.

The Denison approach to studying organizational culture developed from a host of research that focused on organizational culture and organizational effectiveness (Denison 1990, 1996; Denison & Mishra 1995; Fey & Denison 2003; Denison *et al* 2006). This approach studied organizational culture quantitatively via a survey called the Denison's Organizational Culture Survey (DOCS). The survey was formulated on the basis of Denison's organizational culture model. The survey addresses Denison's four cultural traits of Involvement, Consistency, Adaptability and Mission (Denison *et al* 2006). Each of these traits is measured with three component indexes, and each of those indexes is measured with five survey items. The traits are Involvement, Consistency, Adaptability and Mission.

In the DOCS, the involvement trait consists of three indexes:

- Empowerment
- Team Orientation
- Capability Development

The consistency trait consists of:

- Core Values
- Agreement
- Coordination and Integration

The adaptability trait consists of:

- Creating Change
- Customer Focus
- Organizational Learning

The mission trait consists of:

- Strategic Direction and Intent
- Goals and Objectives
- Vision

The items on the survey allow for a quantitative multi-dimensional assessment of the core organizational cultural traits. It focuses on those aspects of organizational culture that appear to influence organizational effectiveness (Denison *et al* 2006).

2.4 Characteristics of an effective psychometric measure

2.4.1 Validity

The validity of a measurement instrument refers to the extent to which a test measures what it is intended to measure (Leedy & Ormorod 2010). The different forms of internal validity are outlined below:

- a) Face validity
This refers to the extent to which a test, on the surface, looks like it is measuring what it is intended to measure (Leedy & Ormorod 2010).
- b) Content validity
It is the extent to which a measurement instrument is a representative sample of the content area being measured. Content validity is a judgement of content coverage (Lee 1999).
- c) Criterion validity
It is the extent to which the results of an assessment instrument correlate with related measures. There are two dimensions of criterion validity. Concurrent validity measures the test against a benchmark test, and high correlation indicates that the test has high criterion validity. The two measures are taken at the same time. Predictive validity is a measure of how well a test predicts an outcome. It involves testing a group of subjects for a certain construct, and then comparing them with results obtained at some point in the future (Leedy & Ormorod 2010).
- d) Construct validity
This refers to the extent to which an instrument measures a construct (a characteristic that cannot be directly observed but is assumed to exist, based on theory. Assessing construct validity involves evaluating the following measurement properties: factorial validity, convergent validity,

and discriminant validity. There are two methods to detect construct validity. Convergent validity tests where constructs that are theoretically expected to be related, are related, and discriminant validity tests situations in which constructs that should have no relationship, in fact, do not have any relationship. (Leedy & Ormrod 2010).

Factorial validity relates to the extent to which a set of measures accurately represents the research construct (Barki & Hartwick 1994). Straub (1989) observed that the appearance of logical factors in factor analysis was confirmation that the measure under investigation exhibited latent variables. As such, the degree of reasonableness of these factors in relation to the construct provides evidence to support the construct validity of the instrument. Factor analysis is of critical importance for construct validation since it is utilized to reduce a larger number of measures to a smaller number (called factors) by discovering which ones measure the same thing and the relations between the clusters of the measures that go together (Kerlinger & Lee 2000).

2.4.2 Reliability

Reliability is the consistency with which a measuring instrument yields a certain result when the entity being measured hasn't changed (Leedy & Ormrod 2010). Consistency is thought to mean repeatability. Diamantopoulos and Schlegelmilch (2000) suggest that two types of consistency are of interest here. The first is consistency over time; that is the extent to which we get similar results from repeated applications of the same measurement instrument to the same set of respondents; this is known as the stability aspect of reliability. The second type is equivalence and indicates the extent to which the same set of respondents reply in a consistent manner on similar items.

Five key types of reliability (Diamantopoulos & Schlegelmilch 2000, Leedy & Ormrod 2010) can be distinguished:

a) Test-retest reliability

To gauge test-retest reliability, the test is administered twice at two different points in time. This kind of reliability is used to assess the consistency of a test across time. This type of reliability assumes that there will be no change in the quality or construct being measured. Generally, reliability will be higher when little time has passed between tests.

b) Equivalency reliability

Equivalency reliability is the extent to which two items measure identical concepts under similar conditions. Equivalency reliability is determined by relating two sets of test scores to one another to highlight the degree of relationship or association.

c) Split-half reliability

In split-half reliability all items that purport to measure the same construct are divided into two sets. The entire instrument is administered to a sample of people and the total score for each randomly divided half is calculated. The split-half reliability estimate is the correlation between these two total scores.

d) Internal consistency reliability

Internal consistency reliability is the extent to which tests or procedures assess the same characteristic, skill or quality. This type of reliability often helps researchers interpret data and predict the value of scores and the limits of the relationship among variables. This form of reliability is used to judge the consistency of results across items on the same test. Essentially, test items that measure the same construct are compared to determine the test's internal consistency. Cronbach's alpha is a measure of internal consistency. It measures how closely related a set of items are as a group (Diamantopoulos & Schlegelmilch 2000).

- e) **Interrater reliability**
- Interrater reliability (scorer) is the extent to which two or more individuals agree. It measures the degree of agreement between persons scoring a subjective test or rating an individual. Interrater reliability addresses the consistency of the implementation of a rating system.

2.4.3 Other psychometric measures

- a) **Ease of administration.** Having questions with high usability means the researcher does not need to be involved in explaining the questions. Moreover, the questionnaire can be completed at the respondents' convenience. Additionally, this allows for the researcher to not be involved at all in explaining questions in order to avoid biasing the results (Leedy & Ormorod 2010).
- b) Another psychometric measure centers on the questionnaire (Leedy & Ormorod 2010). It should
- have clear instructions;
 - be economical in terms of scoring, administering and interpreting;
 - the questions should be relevant, simple, and specific and not be leading questions;
 - the item sequence should start with the questions that interest respondents.
- c) According to Delobbe, Haccoun & Vandenberghe (n.d) measures of organizational culture should empirically demonstrate four characteristics. The first two are generally accepted principles of psychometrics: (a) measures should have high variance and (b) the scale overlap should be low. The other two are consensual validity and inter-organizational discrimination.

- d) On the issue of variance, Delobbe *et al* (n.d.) cite Glick (1985) who argued that, because restricted variances reduce correlation, the validity of climate and organizational culture questionnaires can only be established on samples of diversified organizations from various industries. Some instruments (e.g., the Organizational Culture Profile and the Organizational Culture Inventory), satisfy this requirement and prove their generalizability across a large set of industries.

2.5 Measures of Organizational Culture

In literature several measures of organizational culture are found.

The Competing Values Framework (CVF) was originally presented by Quinn and Rohrbaugh (1983) who were interested in determining the values that employees considered to be valuable with regard to organizational effectiveness. They presented a model of organizational culture based on two dimensions: (1) organizational process (organic vs. mechanistic), and (2) organizational orientation (internal vs. external), which resulted in four types of organizational culture. The 'clan' culture (organic, internal) is characterized by an emphasis on cohesiveness, teamwork and commitment to the organization, whereas the 'market' culture (mechanistic, external) is characterized by competitiveness and goal achievement. The 'adhocracy' culture (organic, external) has as its focus creativity, entrepreneurship, and dynamism. Finally, the 'hierarchy' culture (mechanistic, internal) is characterized by order, rules and regulations, uniformity and efficiency (Quinn and Rohrbaugh 1983).

The Organizational Culture Inventory (OCI) developed by Cooke and Lafferty (1987) (cited in Balthazard, Cooke & Potter 2006) measures twelve sets of behavioral norms associated with three general styles of organizational culture – constructive, passive/defensive, and aggressive/defensive. Basically, the OCI provides a profile of an organization's operating culture in terms of the behaviors members believe are required to 'fit in and meet expectations' within their organization. It measures 'how things are done around here'. The OCI examines how members of an organization experience its operating culture. The OCI measures twelve distinct patterns or styles of behavioral

norms and expectations members of an organization might be expected to adopt in carrying out their work and interacting with others. The twelve patterns are classified into three groups of “styles” with Achievement, Self-actualizing, Humanistic-encouraging and Affiliative belonging to the ‘Constructive Styles’; Approval, Conventional, Dependent and Avoidance belonging to the ‘Passive/defensive Styles’; Oppositional, Power, Competitive and Perfectionistic belonging to the ‘Aggressive/defensive Styles’. The twelve patterns are also categorized in terms of members’ needs: Perfectionistic, Achievement, Self-actualizing, Humanistic-encouraging, Affiliative and Approval represent ‘Satisfaction Needs’; Conventional, Dependent, Avoidance, Oppositional, Power and Competitive represent ‘Security Needs’. The twelve patterns are also used to measure an organization’s culture in terms of its orientation, with some patterns being distinctively related to the ‘People orientation’, such as Self-actualizing, Humanistic-encouraging, Affiliative and Dependent. Other patterns, again, are related to the ‘Task orientation’, such as Competitive, Perfectionistic, and Achievement. Combined OCI scores are then transferred to a circular graph to form a visual profile, or a picture, of an organization’s current culture (Balthazard *et al* 2006).

The Human Factors International’s (2004) Organizational Culture Questionnaire (OCQ) was designed as a practical instrument of measurement and management of organizational culture change. It is a tool used for identifying the culture that is at present operating in the organization. The OCQ does not categorize the organizational culture into a particular type but describes it in terms of its predominant characteristics, behaviors and attitudes. The OCQ comprises 130 questions relating to 13 different dimensions of organizational culture: Leadership, Conflict Management, Productivity, Innovation, Participation, Communication, Decision making, Organizational Goal Integration, Organization Structure, HR Management, Customer Focus, Professionalism and Fun. Members of an organization are asked to decide whether the statements describe a predominant feature of their organization, or not. A further option the OCQ offers is to use a five point scale instead of the simple ‘Yes’, ‘No’, and ‘Don’t know’ options. Respondents are asked to rate whether the statements predominantly describe the behavior and/or beliefs in their organization, and are given five options from ‘Almost

always' to 'Rarely'. The responses can be analyzed for the whole organization or for individual departments (www.hfi.com).

2.6 Construct validity of the Denison Organizational Culture Model Measures

In the South African study of financial institutes, Davidson (2007) found that the correlations between the four organizational culture traits are high, ranging from 0.81 to 0.94. Her conclusion is that the traits could not be strongly differentiated from each other and it thus raised the concerning question as to whether the items were in fact measuring different indices, or a single index. Her assertion is that it could be concluded that the items constructed for each index overlap to the extent that the scales cannot be considered as factorially pure. According to Davidson (2007), similar findings were presented in the original validity studies conducted by Denison (1990). Denison justified these findings by indicating that the results verify that all four traits should be present for the organization to be successful and that the high inter-correlations of the indices thus make sense.

In 2006, Denison *et al*, introduced a paper "Diagnosing Organizational Cultures: Validating a Model and Method". This paper presented a statistical validation of the Denison Organizational Culture Survey using responses from over 35 000 individuals in 160 organizations. The between-index correlations indicated moderate to strong relationships between the various aspects of culture. Factor loadings were reported to be in the .60 to .75 range, indicating considerable shared variance within those items intended to measure the same underlying concepts. A second order confirmatory analysis of the 60 culture survey items as observed variables indicated considerable shared variance between those items intended to measure the same underlying concept. The fit of the indices with the specified model was close, which suggested that the specified model closely approximates the observed pattern of relationships making up the culture assessment. The finding for a test for homogeneity suggested that the organizational cultures for all 160 organizations could be construed as agreed-upon organizational level characteristics.

Cho (2000) conducted a study to determine the validity and reliability of the Denison Organizational Culture Model. He estimated four measurement models for each index (Involvement, Consistency, Adaptability, Mission) separately. It is an item-level analysis; 15 items in each index are analyzed to check whether three scales (3 latent constructs) are extracted from 15 items. The purpose of the item-level analysis undertaken by Cho was to identify the presence of latent constructs (scales) in the Denison Organizational Culture questionnaire. The analysis method employed was a factor analysis: exploratory factor analysis (factor loading tables) and confirmatory factor analysis (RMSEA and fit statistics). Then for each pair of indexes, he combined them two by two and then estimated six measurement models for all indexes. It provides a scale-level analysis; six scales (3 scales from each index) are analyzed to establish how the six scales are interrelated. His results show that all indexes had alpha coefficients in the range of 0.620 and 0.900. A confirmatory factor analysis confirmed that the index structure fits the model itself (Cho 2000).

2.7 Criterion-related Validity of the Denison Organizational Culture Model measures

Where the focus in section 2.2 was to find theoretical links between organizational culture and other concepts, the aim here is to find empirical evidence between organizational culture and other concepts. In this regard, academic journals were consulted.

In the paper, "Diagnosing Organizational Cultures: Validating a Model and Method", (Denison *et al* 2006) the respondents' culture traits were aggregated at the organization level to examine differences in culture ratings across organizations, as well as the relationships between culture indexes/traits and organizational effectiveness. This study found that correlations between culture and employee satisfaction were the highest and correlations with market share, the lowest. Culture indexes and traits were modest predictors of sales growth, profitability, quality and new product development. These results demonstrated a strong link between aspects of organizational culture and organizational effectiveness measures. According to this study:

- Sales growth correlates with external focus of adaptability and mission
- Operating profit measures, such as quality and profitability, correlates with internal traits, such as involvement and consistency
- New product development is least strongly correlated with internal consistency, and
- Involvement is the strongest predictor of employee satisfaction.

Findings of research conducted by Denison and Mishra (1995) indicated several relationships between culture and performance. Revenue growth and market share (both externally oriented measures) are supported by the externally oriented cultural traits of mission and adaptability. Quality and employee satisfaction (internally oriented performance measures) are supported by the internally oriented culture traits of involvement and consistency. Innovation (a performance measure related to flexibility) is supported by cultural traits of involvement and adaptability.

A study was conducted by Nguyen and Mohamed (2009) on the relationship between leadership behaviors, organizational cultures and knowledge management (KM) practices. The Denison Organizational Culture Survey was used to measure the organizational culture. From this study, Nguyen and Mohamed report that literature highlights the impact of organizational culture on the effectiveness of leadership,

In a study conducted to determine the relationship between organizational culture and employee engagement (www.denisonculture.com 2010), 90 organizations were sampled using the Denison organizational culture survey and the engagement module. The outcome was that firms with low scores on culture also had lower engagement scores. Organizations with strong culture scores had higher engagement scores. This research revealed that four key survey items correlate to employee engagement:

- Our vision creates excitement and motivation for our employees (Mission: Vision)
- There is a clear mission that gives meaning and direction to our work. (Mission: Strategic Direction and Intent)

- Everyone believes that he or she can have a positive impact. (Involvement: Empowerment)
- The leaders and managers practice what they preach. (Consistency: Core values)

A total of 295 health care employees completed the Denison Organizational Culture Survey (OCS) and the Job Descriptive Index (JDI) (Goldston 2007). The study reported significant associations between the traits of organizational culture (mission, involvement, adaptability, consistency) and facets of job satisfaction (satisfaction with pay, satisfaction with coworkers, satisfaction with supervision, satisfaction with opportunities for advancement, satisfaction with work itself and general job satisfaction). From this study, Denison's four traits of organizational culture explained 42% of the variance in satisfaction with pay and 29% of the variance in satisfaction with coworkers. Specifically, organizational adaptability significantly predicted satisfaction with coworker relationships, while organizations' level of employee involvement predicted satisfaction with pay as well as general job satisfaction.

Carmeli (2005) studied the relationship between organizational culture and withdrawal intentions and behavior. He listed withdrawal intentions as comprising constructs of thinking of quitting, intention to search and intention to quit, which have been studied in relation to withdrawal behavior (e.g. absenteeism, actual turnover). The results of this study indicated that employees' withdrawal behavior and intentions are partly related to an organizations culture. An organization culture that provides challenging jobs reduced employees' absenteeism and withdrawal intentions.

Taylor, Orly, Boyacigiller & Beechler (2008) studied the impacts of organizational culture, HRM=Human Resource Management? And top management orientations on employee commitment in multinational corporations. Organizational commitment was measured using the nine-item short form of the Organizational Commitment Questionnaire (OCQ), and measures of organizational culture were based on scales drawn from the Denison Organizational Culture Survey. Mission and adaptability are the two cultural dimensions that positively affect commitment. Perception of a sense of mission indirectly affects commitment through its effect on the global orientation of top management. Perception of a culture of adaptability, on the other hand, affects

commitment strongly and directly, as well as indirectly through global orientation. The result of this study is that an organizational culture characterized by high adaptability was found to have a significant and direct effect on employee commitment.

2.8 Pool of organizational culture measurement items

The following is a list of items that are included in the Denison Organizational Culture Survey.

Table 2.1 Traits and dimensions measured by Denison’s organizational culture survey:

Trait	Dimension	Example of items
Involvement	Empowerment	Everyone believes that he/she can have a positive impact
	Team orientation	Working in this organization is like being part of a team
	Capability development	This organization continues to invest in the skills of people
Consistency	Core values	This organization has an ethical code that guides our behavior and tells us right from wrong
	Agreement	It is easy to reach consensus, even on difficult issues
	Coordination and integration	There is good alignment of goals across levels of this organization
Adaptability	Creating change	This organization is very responsive and changes easily
	Customer focus	Customer input directly influences our decisions
	Organizational learning	We view failure as an opportunity for learning and improvement
Mission	Strategic direction and intent	This organization has long term purpose and direction

	Goals and objectives	There is widespread agreement about goals in this organization
	Vision	Our vision creates excitement and motivation for our employees

Source: Denison and Fey (2003, p704)

2.9 Chapter summary

This chapter reviewed literature relevant to organizational culture. Five definitions of the concept were provided. Three theories and two models regarding the concept were found and presented. Thereafter, the elements of the concept were explored from five perspectives. Then the validity and reliability of an effective psychometric measure were discussed. The chapter was concluded by identifying possible measures for organizational culture, evaluating the measures for construct and criterion-related validity, and suggesting a list of possible items that could be considered as a measure of organizational culture.

In the next chapter the method of the research is discussed.

CHAPTER 3: METHODOLOGY

In this chapter the general aim of the empirical study, as well as the specific research aims are described. These specific aims will guide the empirical process and process decisions will be made on guidelines set out in the statistical analysis part of this chapter. The research design and procedure, as set out in Chapter 1, will also be presented. The method of sample collection is discussed as well as a detailed description of the questionnaires that were used. Lastly the selected statistical procedures are discussed, with specific reference to decision-making.

3.1 Aim of the empirical study

The primary aim of the empirical study was to adapt and evaluate a measure of organizational culture for use in the mining industry in South Africa. Such an instrument should enable future researchers to do research in South Africa within the mining industry with the knowledge that they use a measure adapted for that environment. In many respects this is primary research.

3.2 Addressing specific empirical aims

Under this heading 1.6.2.1 empirical aims that can be addressed through statistical analysis were listed. These are (1) to eliminate items based on their low correlation with construct (correlation matrix), (2) low factor-loadings, and high levels of (3) gender and (4) race bias. Also, to (5) determine reliability of the shortened (cleaned-up) questionnaire. The last empirical aim was to determine the (6) correlation between the cleaned-up measured concept and other measured concepts. As the concept theoretically consists of subcomponents, (7) factor analysis would be done to report on the factorial validity of the shortened measure.

3.3 Research design

A cross-sectional research design was used. This design is suitable for describing the population as well as the calculation of correlations between measured constructs (Shaughnessy, Zechmeister & Zechmeister 2009). The design suits this research effort well as this research is primarily descriptive and relational.

3.4 Research process

The research consists of a literature review and an empirical investigation.

3.4.1 Literature review

The steps taken in the literature review were as follows:

- Step 1: Define the concept from several perspectives. The goal in this part of the research was to come to a thorough understanding what is meant when this word is used and to describe how it will be used in this research. This relates to conceptual validity of the proposed measure.

- Step 2: Describe how the concept relates to other variables. In this part the theories and models regarding the concept were presented. This information was used as a basis to make comments regarding the concurrent, discriminate and possible predictive validity of the proposed measure.

- Step 3: Compile several lists of the elements, if any, of which the concept comprises. Here the objective was to identify the building block of the concept. The goal was to find the elements that needed to be included in the measure. This relates to the construct validity of the measure.

- Step 4: Write notes on the validity and reliability of a psychometric measure, and the characteristics of a good measure and its items.
- Step 5: List measures and describe the measures of the concept. The idea in this section was to find a measure that can possibly be used in the local context or model items to be included in a new measure.
- Step 6: Describe how the measures relate to the elements of the concept. With Step 6 the measures found were evaluated for construct validity.
- Step 7: Describe how the measured concept relates to other variables. With Step 7 information regarding criterion-related validity of the existing measures was searched for.
- Step 8: Suggest the selected measure or pool of items to be considered as a measure of the concept.

The literature review set the stage for the empirical investigation.

3.4.2 Empirical investigation

The empirical investigation will consist of ten steps:

- Step 1: Continuing from the literature review, compile, after consultation with the fellow students and the study leader, a list of items to be to be tried out in the empirical investigation.
- Step 2: Compile a battery which include items of this concept and combine that with other questionnaires. The idea was that when several measures were included in a battery, information on concurrent, discriminant, and factorial validity can be collected.

- Step 3: Try the battery out on a group of fellow students for comments. This allowed for the linguistic modification of the questionnaire as well as comments regarding the face validity thereof.
- Step 4: Decide on a suitable sample to administer the battery on in order to determine its psychometric characteristics. Sample selection is discussed in greater detail in section 1.6.2.2.
- Step 5: Gain consent from the participants and administer the battery. All participation was voluntary and the participants were informed about their rights as participant and the purpose of the research. Consent forms were handed to each participant (see Annexure A).
- Step 6: Capture the data on an Excel spreadsheet. This was done in groups of two students in order to eliminate punching errors.
- Step 7: Eliminate items based on their low correlation with construct (correlation matrix) or factor (factor analysis), and high levels of gender and race bias. This was done in consultation with the study leader.
- Step 8: Determine reliability of the shortened questionnaire. The reliability of the shortened questionnaire was expressed as a Cronbach alpha coefficient.
- Step 9: Determine the correlation between (the cleaned up) measured concept and other concepts measured and identified in the literature review. Evidence regarding convergent and discriminate validity was created in this manner. In cases where the concept theoretically consists of subcomponents, factor analysis would be done to report on the factorial validity of the shortened measure.
- Step 10: Discuss the utility of the questionnaire for future use. Here the evidence gathered regarding the reliability and validity of the questionnaire was presented.

3.5 Sample

As stated in Chapter 1 it was difficult to find a representative sample of employees in the mining environment. Three organisations were willing to cooperate in this research. These were Exxaro Resources (N=2035), Sasol Mining (N=1048) and Lonmin (N=2963). The fact that the participating organizations were not identified through a randomization process, but that the researchers accessed respondents in environments they had access to, make this an opportunity sample (Rosnow & Rosenthal 2008).

Once the organizations / sections were identified, a random sample of 50 possible participants was drawn from the all possible respondents within each of the organization. The 50 were drawn using a numeric name list of all employees and selecting individuals from this list using random numbers generated on the internet (<http://www.random.org/integers/>). The total number of participants was 147.

Two exclusion criterion were used. The one was educational level. It was a requirement that all respondent have at least grade 12 qualifications in order to make it easy for them to complete the questionnaires. The other was that only individuals that understood and were willing and able to agree to the conditions of the informed consent form were included in the group that was assessed. The informed consent form is attached in Annexure A.

3.6 Measuring instruments

Five instruments were used, namely the the adapted Denison Organizational Culture Survey, Affective Commitment part of the Organizational Commitment Scale (OCS; Allen & Meyer 1990), the General Satisfaction items of the Job Diagnostic Survey (JSS; Hackman & Oldham 1975; in Fields 2002), the Utrecht Work Engagement Scale-9 (UWES-9; Schaufeli, Bakker, & Salanova 2006), and Section VIII of the Workplace Scale (ITQS; Firth, Mellor, Moore & Loquet 2004). The last mentioned questionnaire measures employees' intention to quit their present employment.

The development and characteristics of organizational culture is discussed in detail in section 2.6, 2.7 and 2.8 and will not be repeated here. This leads us to the other measures.

The Organizational Commitment Scale (OCS; Allen & Meyer 1990) can be used to assess affective, continuance, and normative commitment. The scale consists of 24 questions, 8 on affective, 8 on continuance, and 8 on normative commitment. Only the 8 questions on affective commitment were used, as it is common practice to interpret the sections of the test separately. The first item of the affective commitment part of the scale reads as follows: "I would be very happy to spend the rest of my career with this organization." Respondents are requested to indicate their views on this statement on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). The minimum score is 8 and the maximum 56. A high score on the scale would be indicative of high levels of commitment and low scores would be indicative of low commitment. Allen and Meyer (1990) report a mean item score of 4.36 (standard deviation=1.38) for affective commitment, and an internal consistency coefficient of .86 for the affective commitment section. Allen and Meyer (1990) report evidence of construct validity, although there are some overlaps between affective and normative commitment. They also report that the "relationship between though commitment measures ... and the antecedent variables ... was, for the most part, consistent with prediction" (p. 13). This points to convergent and discriminant validity.

The General Satisfaction items of the Job Diagnostic Survey (JSS; Hackman & Oldham 1975; in Fields 2002) are "an overall measure of the degree to which the employee is satisfied and happy with the job" (Hackman & Oldham 1975, p162). This part of the survey consists of 5 items. The following is the first item from General Satisfaction part of the survey: "Generally speaking, I am very satisfied with this job". Respondents are requested to indicate their views on this statement on a scale ranging from 1 (disagree strongly) to 7 (agrees strongly). The minimum score is 5 and the maximum 35. A high score on the survey would be indicative of a high job satisfaction and a low score would indicate that the respondents are not satisfied with their job. The sample mean per item is 4.62 with a standard deviation of 1.18. Hackman and Oldham (1975) report an internal

consistence of .76 for General Satisfaction and, with regard to validity, reports 'adequate' discriminant validity and that the theory-specific relationships among the scales are in the predicted direction. This points to construct validity.

The Utrecht Work Engagement Scale–9 (UWES-9; Schaufeli, Bakker, & Salanova 2006) is a summative assessment of the three dimensions of engagement, namely vigour, dedication, and absorption (Schaufeli *et al* 2006). The questionnaire consists of 9 items. The following is a typical item from the scale: “At my work, I feel bursting with energy”. Respondents are requested to indicate their views on this statement on a scale ranging from 0 (never) to 6 (every day). The minimum total score is 0 and the maximum 54. A high score on the survey would be indicative of high levels of engagement and a low score would indicate that the respondents are not engaged. The average score per item for vigour is 4.18 (standard deviation=1.24), dedication 4.28 (standard deviation=1.36), and absorption 4.68 (standard deviation=1.43). The total mean score per item is 4.05 (standard deviation=1.19), which equate to a total observes score of 36.54 (standard deviation=10.71). Schaufeli and Bakker (2003, p 33) report that the “Cronbach's α of all 9 items varies from .85 to .94 (median=.91) across the 9 national samples. The α -value for the total database is .90”. With regard to validity Schaufeli and Bakker (2003) report that the suggested three-factor structure of engagement is confirmed (cross samples from different countries) and that the construct is related to other constructs in the expected manner. This suggests construct validity.

Section VIII of the Workplace Scale (ITQS; Firth *et al* 2004) measures employee intentions to quit their present jobs. The questionnaire consists of 2 items. The first item reads as follows: How often do you think of leaving your present job? On this item respondents are requested to indicate their views on this statement on a scale ranging from 1 (rarely or never) to 5 (very often). The second item reads as follows: “How likely are you to look for a new job within the next year?” Response format for this question ranges from 1 (very unlikely) to 5 (very likely). The minimum score is 2 and the maximum 10. A high score would be indicative of respondents likely to leave the job while a low score would indicate respondents likely to stay with the job. Firth *et al* (2004) report that the mean for this section is 5.21 with a standard deviation of 2.06. With

regard to reliability, they report an α -value of 0.75. With regard to construct validity Firth *et al* (2004) was able to show that intention to quit correlated in the expected manner with related constructs.

3.7 Statistical analysis and decision making

As indicated in section 1.6.2.4, correlation coefficients, factor analysis, multivariate analysis of variance, reliability coefficients (Cronbach's alpha), and again correlations coefficient were computed. This is apart from the normal descriptive statistics, namely the mean, standard deviation, kurtosis and skewness that will be calculated.

In this case the Pearson product-moment correlation coefficient will be calculated. The Pearson product-moment correlation coefficient is a measure of the strength of a linear association between two variables. The Pearson product-moment correlation coefficient can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, that is, as the value of one variable increases so does the value of the other variable. A value less than 0 indicates a negative association, that is, as the value of one variable increases the value of the other variable decreases. For the purposes of this research all statistically significant correlations will be reported ($p < .05$) and correlations where the shared variance is greater than 20% will be interpreted as practically meaningful (Cohen 1988). For example, when a correlation of $r = .13$ ($p = .04$) is reported, the coefficient of determination is $R^2 = .02$ ($.13 \times .13 = .02$), that is the shared variance between the two constructs is only 2%, and not practically significant compared to the 20% margin set by Cohen (1988).

Factor analysis is a technique used to analyze multiple measurements and identify underlying causes for any relationships between the measurements. When comparing the results of several tests, correlations between the results of any two tests taken together can be determined. This suggests that the two tests have something in common. The theory behind factor analysis is that the reason these two tests are correlated is that both are trying to get at a factor that cannot be measured directly.

Because the factor influences both tests, a subject's score on one test can tell you something about their score on the other test (Barki & Hartwick 1994). In the case of this research a principle component analysis was carried out followed by an oblique rotation (Promax) to crystallise the solution. A fixed number of factors will be extracted based on the number of theoretical constructs suggested to be part of the measured construct. This was also done in cases where the structure was expected to consist of only one factor. Only items with factor loadings of more than .5 were used in naming the factors or selecting items. No rotations were performed when one fixed factor was extracted, as this is obviously impossible.

Multivariate analysis of variance is used when there are two or more dependent variables. It can be used to determine whether changes in the independent variable(s) have significant effects on the dependent variables and what the interactions among the dependent variables and among the independent variables are. The analysis of variance provides a statistical test of whether or not the means of several groups are all equal. Analysis of variance procedure was used to detect gender and race bias. Item scores were used as the dependent variable with race (or gender) and the score levels (the total score on the scale) as independent variables. The score levels were presented on a scale of 1 to 4, where a score of 1 was allocated to respondents whose scores were in the first quadrant of the group's scores; and a score of 2 to respondents whose score fell in the second quadrant, and so forth. A significant main effect for race (or gender) was deemed to be indicative of uniform bias, while a significant interaction effect for score level and race was seen as pointing to non-uniform bias (Meiring *et al* 2005).

The reliability of the questionnaire, as expressed with the Cronbach's coefficient alpha, provides a measure of the internal consistency of a test or scale; it is expressed as a number between 0 and 1. Internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test (Mohsen & Dennick 2011).

Some authors (cf. Hair, Black, Babin, Anderson & Tatham 2006) consider a Cronbach's alpha coefficient greater than .60 to be indicative of satisfactory reliability. Others (cf. Spatz & Kardas 2008), however, set the mark much higher, at .80. For the purpose of

this research acceptable coefficients for the different questionnaires were set at the higher margin of .80. This mark is considered to be high as it is difficult to obtain high coefficients with a small number of items (Pallant 2007), as is the case in this research.

With regard to descriptive statistics mean, standard deviation, kurtosis and skewness are to be calculated. The statistical mean is the arithmetic average of the values and gives an indication of the measure of the central location for metric data; the standard deviation measures the variability of data in a sample and is an indication of how far the values in a data set deviate from the mean; the kurtosis is an indication of the peakedness of the distribution. Kurtosis that is normal involves a distribution that is bell-shaped and not too peaked or flat. Positive kurtosis is indicated by a peak. Negative kurtosis is indicated by a flat distribution. The skewness is an indication of the symmetry of the distribution (Diamantopoulos & Schlegelmilch 2000). With regard to kurtosis, for a sample of 200, heavier tails (platykurtic shape) are below a value of -.47 and a sharper peak (leptokurtic shape) are higher than .62 (Doane & Seward 2009). For a sample of 200 as the lower limit for skewness (skewed to the left) is -.281 and the upper limit (skewed to the right) is .281. These cut-off scores will be used in making comments with regard to kurtosis and skewness.

3.8 Chapter summary

In this chapter the aim of the empirical study was discussed and the research hypotheses were set. The way the sample was collected was described and the five questionnaires that were used were discussed in terms of its psychometric characteristics. The chapter concluded with the discussion of the statistical calculations with specific reference to the cut-off scores.

CHAPTER 4: RESULTS

In this chapter the results of the study are reported. Firstly descriptive information on the group that was assessed will be presented. This will be followed by an analysis of the items to determine their suitability for inclusion into the final questionnaire. Once a decision is made on which items to include in the questionnaire, the descriptive statistics on the measure Organizational Culture will be presented. This will be followed by a report on the reliability of the selected items, and finally validity information.

4.1 Sample

In total 147 respondents were assessed. The number of males was 83 (56.5%) and the number of females was 64 (43.5%). In total there were 50 black people, 15 indian people, 3 colored and 79 white people. The respondents were from 3 companies. From the first company, namely Exxaro there were 50 respondents, from company two, Lonmin there were 46 respondents, and from the third company Sasol Mining there were 51 people.

4.2 Analyses of items for suitability

Three techniques were used to identify items that do not qualify for inclusion in the final questionnaire. These were low correlations with the total score, low loading on the underlying construct, and gender and race bias. These results are presented in the following few pages followed by a table to summarize the results.

4.2.1 Item analysis based on low correlation with total score

In Table 4.1 the correlations between the individual items and the total score of the measure is presented.

Table 4.1

Correlations between individual items and total score

Construct – Organizational Culture	Item number test	/ in	Correlation with construct	Total Score
Involvement	1 / 102		r = .753	r = .532
Involvement	2 / 103		r = .699	r = .638
Involvement	3 / 104		r = .798	r = .638
Involvement	4 / 105		r = .712	r = .652
Involvement	5 / 106		r = .648	r = .516
Involvement	6 / 107		r = .806	r = .649
Consistency	7 / 108		r = .642	r = .725
Consistency	8 / 109		r = .419	r = .456
Consistency	9 / 110		r = .793	r = .707
Consistency	10/ 111		r = .744	r = .559
Consistency	11 / 112		r = .760	r = .617
Consistency	12 / 113		r = .586	r = .345
Adaptability	13 / 114		r = .662	r = .305
Adaptability	14 / 115		r = .607	r = .354
Adaptability	15 /116		r = .558	r = .403
Adaptability	16 /117		r = .658	r = .576
Adaptability	17 /118		r = .610	r = .618

Adaptability	18 /119	r = .627	r = .587
Mission	19/120	r = .739	r = .678
Mission	20/121	r = .773	r = .686
Mission	21 /122	r = .765	r = .658
Mission	22 /123	r = .717	r = .535
Mission	23 /124	r = .736	r = .577
Mission	24 /125	r = .468	r = .445

In the table it can be observed that the following items have lower loadings than 0.60:

- Item 8, “There is an ethical code that guides our behavior and tells us right from wrong”, has a low loading on the construct (Consistency) as well as on the total score.
- Item 12, “It is easy to coordinate projects across different parts of the organization”, has a low loading on the construct (Consistency) as well as on the total score.
- Item 15, “Customer input directly influences our decisions”, has a low loading on the construct (Adaptability) as well as on the total score.
- Item 24, “We are able to meet short-term demands without compromising our long-term vision”, has a low loading on the construct (Mission) as well as on the total score.

These low loadings on the construct as well as total score may suggest that these items do not measure the construct in the same way as the other items do.

4.2.2 Item analysis based on low loading latent construct

In Table 4.2 the factor loadings of the individual items on the latent construct inherent to the measure is presented.

Table 4.2

Principal component analysis with Varimax rotation and Kaiser Normalization

Factor number	Factor1	Factor 2	Factor 3	Factor 4
Factor name	Involvement	Consistency	Adaptability	Mission
Item / number in test				
1 / 102	.750			
2 / 103	.594			
3 / 104	.680		.474	
4 / 105	.710			
5 / 106	.476			
6 / 107	.777			
7 / 108	.791			
8 / 109			.477	
9 / 110		.655		
10 / 111		.610		
11 / 112		.583		
12 / 113		.687		
13 / 114		.823		
14 / 115		.708		
15 / 116				.435
16 / 117				.599

17 / 118			.739	
18 / 119			.757	
19 / 120			.756	
20 / 121			.489	
21 / 122	.513		.538	
22 / 123				.712
23 / 124				.576
24 / 125		.544		.425

All values smaller than .40 were suppressed.

In the table it can be observed that:

Item 3, “Cooperation across different parts of the organization is actively encouraged”, loads on 2 factors, namely Involvement and Adaptability. It does however load predominantly on the factor it is purported to measure i.e. Involvement. This item will thus be deemed to load on the latent construct and be seen as factorially valid.

Item 7, “The leaders and managers "practice what they preach", demonstrates low factorial validity. It is not in line with the construct it is purported to measure i.e. Consistency. It loads instead on the Involvement construct and can therefore not be considered as factorially valid.

Low factorial validity is also evident for item 8, “There is an ethical code that guides our behavior and tells us right from wrong.” It is not in line with the construct it is purported to measure i.e. Consistency. It loads on the Adaptability construct.

Items 13, “The way things are done is very flexible and easy to change” and 14, “New and improved ways to do work are continually adopted”, also demonstrate low factorial validity and load on the Consistency construct instead of the Adaptability construct.

Item 15, “Customer input directly influences our decisions” and item 16, “All members have a deep understanding of customer wants and needs”, load on the Mission construct instead on the Adaptability construct and can therefore not be considered as factorially valid

The item 21, “Leaders set goals that are ambitious, but realistic”, loads on two constructs i.e. Involvement and Adaptability but not on the factor it is purported to measure i.e. Mission. It loads predominantly on the Adaptability construct.

The item 24, “We are able to meet short-term demands without compromising our long-term vision”, loads on 2 constructs but not predominantly on the factor it is purported to measure i.e. Mission. It loads predominantly on the Consistency construct and can therefore not be considered as factorially valid

4.2.3 Item analysis based on gender bias

In Table 4.3 the results on an analyses of variance procedure, aimed at detecting gender bias in the individual items of the organizational culture questionnaire is summarized.

Table 4.3

Test of between subject effects with gender and item score predicting total score

Item / number in test	Dependent variable	Independent variable: Gender		Independent variable: Standing on the construct	
		F	Significance	F	Significance
1 / 102	Involvement	.041	.840	187.89	.000
2 / 103	Involvement	2.007	.159	140.91	.000
3 / 104	Involvement	.004	.948	252.27	.000
4 / 105	Involvement	.040	.841	147.56	.000

5 / 106	Involvement	.143	.706	103.552	.000
6 / 107	Involvement	.557	.457	266.273	.000
7 / 108	Consistency	3.198	.076	105.382	.000
8 / 109	Consistency	.022	.882	29.765	.000
9 / 110	Consistency	.008	.927	237.885	.000
10 / 111	Consistency	.002	.968	174.174	.000
11 / 112	Consistency	.006	.937	191.766	.000
12 / 113	Consistency	3.273	.073	71.206	.000
13 / 114	Adaptability	2.215	.139	107.311	.000
14 / 115	Adaptability	0.066	.797	81.845	.000
15 / 116	Adaptability	0.672	.414	62.356	.000
16 / 117	Adaptability	.001	.974	107.898	.000
17 / 118	Adaptability	2.014	.158	88.718	.000
18 / 119	Adaptability	2.705	.102	97.771	.000
19 / 120	Mission	3.230	.074	177.823	.000
20 / 121	Mission	0.123	.726	213.802	.000
21 / 122	Mission	3.282	.072	208.842	.000
22 / 123	Mission	1.221	.271	152.543	.000
23 / 124	Mission	0.102	.750	170.464	.000
24 / 125	Mission	3.429	.066	40.832	.000

In the table it can be observed that gender does not influence the response to items more than the constructs. It can be surmised that the organizational culture survey is not subject to gender bias.

4.2.4 Item analysis based on race bias

In Table 4.4, similar to Table 4.3, the results on an analysis of variance procedure, aimed at detecting race bias in the individual items of the organizational culture questionnaire, is summarized. As mentioned earlier in Chapter 3, when using the *analysis of variance procedure*, item scores are used as the dependent variable with, in this case, race and the score levels (the total score on the scale) as independent variables. The score levels were presented on a scale of 1 to 4, where a score of 1 was allocated to respondents whose scores were in the first quadrant of the group's scores; and a score of 2 to respondents whose score fell in the second quadrant, and so forth. A significant main effect for race was deemed to be indicative of uniform bias, while a significant interaction effect for score level and race was seen as pointing to non-uniform bias (Meiring *et al* 2005).

Table 4.4

Test of between subject effects with race and item score predicting total score

Item / number in test	Dependent variable	Independent variable: Race		Independent variable: Standing on the construct	
		F	Significance	F	Significance
1 / 102	Involvement	.000	.997	170.505	.000
2 / 103	Involvement	.527	.469	119.856	.000
3 / 104	Involvement	.614	.434	222.238	.000
4 / 105	Involvement	12.968	.000	174.248	.000

5 / 106	Involvement	2.225	.138	86.771	.000
6 / 107	Involvement	.206	.650	237.599	.000
7 / 108	Consistency	10.933	.001	102.551	.000
8 / 109	Consistency	.148	.701	30.092	.000
9 / 110	Consistency	.111	.739	241.426	.000
10 / 111	Consistency	.119	.731	175.753	.000
11 / 112	Consistency	.610	.436	196.842	.000
12 / 113	Consistency	10.509	.001	84.107	.000
13 / 114	Adaptability	14.851	.000	114.935	.000
14 / 115	Adaptability	1.893	.171	82.179	.000
15 / 116	Adaptability	.519	.472	66.024	.000
16 / 117	Adaptability	.086	.770	109.727	.000
17 / 118	Adaptability	4.584	.034	91.273	.000
18 / 119	Adaptability	9.642	.002	104.647	.000
19 / 120	Mission	2.809	.096	157.856	.000
20 / 121	Mission	5.436	.021	225.859	.000
21 / 122	Mission	.111	.739	190.977	.000
22 / 123	Mission	2.235	.137	138.577	.000
23 / 124	Mission	.959	.329	157.577	.000
24 / 125	Mission	4.244	.041	45.567	.000

From the results captured in table 4.4, it can be presented that race as well as the constructs contributed significantly to the variance on the variability for certain items. It can be surmised that race bias is suspected for items on the constructs as follows:

On the involvement construct:

Item 4, "People work like they are part of a team".

On the consistency construct:

Item 7, "The leaders and managers practice what they preach".

Item 12, "It is easy to coordinate projects across different parts of the organization".

Item 13, "The way things are done is very flexible and easy to change".

On the adaptability construct -

Item 17, "We view failure as an opportunity for learning and improvement".

Item 18, "Learning is an important objective in our day-to-day work".

On the mission construct:

Item 20, "There is a clear strategy for the future".

Item 24, "We are able to meet short-term demands without compromising our long-term vision".

These results are not seen in a very serious manner as the racial groups sizes differ meaningfully, for example, only 3 colored people formed part of the sample, and this group is included in the aforementioned analysis.

4.2.5 Summary of item analyses aimed at testing suitability of items

In Table 4.5 the results on the four aforementioned analyses are integrated into one table to facilitate the decision-making regarding eliminating items from the original questionnaire.

Table 4.5

Combined and summative results of Table 4.1.to 4.4.

Construct – Organizational Culture	Item / number in test	Correlation with construct	Loading on factor	Gender bias	Race bias
Involvement	1 / 102	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Involvement	2 / 103	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Involvement	3 / 104	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Involvement	4 / 105	$r > .60$	Loading $> .5$	$p > .05$	$p < .05$
Involvement	5 / 106	$r > .60$	Loading $< .5$	$p > .05$	$p > .05$
Involvement	6 / 107	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Consistency	7 / 108	$r > .60$	Loading $> .5$	$p > .05$	$p < .05$
Consistency	8 / 109	$r < .60$	Loading $< .5$	$p > .05$	$p > .05$
Consistency	9 / 110	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Consistency	10 / 111	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Consistency	11 / 112	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Consistency	12 / 113	$r < .60$	Loading $> .5$	$p > .05$	$p < .05$
Adaptability	13 / 114	$r > .60$	Loading $> .5$	$p > .05$	$p < .05$
Adaptability	14 / 115	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Adaptability	15 / 116	$r < .60$	Loading $< .5$	$p > .05$	$p > .05$
Adaptability	16 / 117	$r > .60$	Loading $> .5$	$p > .05$	$p > .05$
Adaptability	17 / 118	$r > .60$	Loading $> .5$	$p > .05$	$p < .05$

Adaptability	18 / 119	$r > .60$	Loading > .5	$p > .05$	$p < .05$
Mission	19 / 120	$r > .60$	Loading > .5	$p > .05$	$p > .05$
Mission	20 / 121	$r > .60$	Loading < .5	$p > .05$	$p < .05$
Mission	21 / 122	$r > .60$	Loading > .5	$p > .05$	$p > .05$
Mission	22 / 123	$r > .60$	Loading > .5	$p > .05$	$p > .05$
Mission	23 / 124	$r > .60$	Loading > .5	$p > .05$	$p > .05$
Mission	24 / 125	$r < .60$	Loading < .5	$p > .05$	$p < .05$

In the table it can be observed that race bias is suspected for the items:

Item 4, "People work like they are part of a team".

Item 7, "The leaders and managers "practice what they preach".

Item 12, "It is easy to coordinate projects across different parts of the organization".

Item 13, "The way things are done is very flexible and easy to change".

Item 17, "We view failure as an opportunity for learning and improvement".

Item 18, "Learning is an important objective in our day-to-day work".

Item 20, "There is a clear strategy for the future".

Item 24, "We are able to meet short-term demands without compromising our long-term vision".

The following items had a correlation with the consistency construct lower than the .6 limit and also had a factor loading lower than the .5 cut off limit.

Item 5, "Authority is delegated so that people can act on their own".

Item 8, "There is an ethical code that guides our behavior and tells us right from wrong".

The item 12, "It is easy to coordinate projects across different parts of the organization" has a correlation with the consistency construct lower than the .6 limit and is also susceptible to probable race bias.

Item 15, “Customer input directly influences our decisions”, had a correlation with the adaptability construct lower than the .6 limit and also had factor loading lower than the .5 cut off limit;

Item 20, “There is a clear strategy for the future”, had a factor loading on the mission construct of less than .5 and also exhibits potential racial bias.

Item 24, “We are able to meet short-term demands without compromising our long-term vision”, had a correlation with the mission construct lower than the .6 limit, demonstrates factor loading lower than the .5 cut off limit and is potentially racially biased.

In summary although interpretation of the items above should be approached with caution, they should not be excluded from the organizational culture questionnaire since the items used were included in the original standardized instrument.

4.3 Descriptive statistics

In Table 4.6 the descriptive statistics for the organizational culture questionnaire is presented.

Table 4.6
Descriptive statistics

Subtest	N	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
Involvement	147	7	30	20.1905	4.59799	-.366	-.480
Consistency	146	10	27	19.6370	3.59479	-.271	-.374
Adaptability	147	11	28	20.5510	3.48024	-.436	-.489
Mission	147	12	30	21.4558	3.63814	-.276	-.338

In the table it can be observed that that the distribution of the scores does not follow a normal distribution pattern. From chapter 3, the cut off scores of -.281 was set as lower limit for skewness (skewed to the left) and the upper limit (skewed to the right) is

.281. The data in table 4.6 indicates negative skewness (tail extending to the left) for all values. In the case of Involvement and Adaptability the values were larger than the cutoff scores, indicating that these variables had a skew distribution. With regard to kurtosis, the cut of scores as set out in chapter 3, indicated that values below $-.47$ was representative of heavier tails (platykurtic shape) and values that are higher than $.62$ indicated a sharper peak (leptokurtic shape) (Doane *et al* 2009). The data in table 4.6 is indicative of heavier tails, a platykurtic shaped distribution.

4.4 Reliability

As discussed in chapter 3, some authors (cf. Hair *et al* 2006) consider a Cronbach's alpha coefficient greater than $.60$ to be indicative of satisfactory reliability whereas others (cf. Spatz *et al* 2008), however, set the mark much higher, at $.80$. For the purpose of this research acceptable coefficients for the different questionnaires were set at the higher margin of $.80$. The reliability coefficients for the individual constructs are as follows: Involvement $.832$; Consistency $.742$; Adaptability $.789$ and Mission $.677$; the total reliability coefficient for all the constructs is $.903$. The coefficients for the Consistency, Adaptability and Mission constructs are low based on the guideline of $.80$ set out in chapter three (cf. Spatz *et al* 2008). From the total reliability coefficient of $.93$, it may be concluded that the adapted Denison Organizational Culture Survey questionnaire shows sufficient internal consistency to be regarded as reliable for use in a South African mining industry

4.5 Validity

The validity of the organizational culture questionnaire will be discussed with reference to concurrent validity and factorial validity.

As mentioned in the Chapter 2 concurrent validity is a type of criterion validity and refers to the fact that certain variables, assessed at a specific time, will stand in a particular relationship to each other.

This correlation between variables measured at the same time and confirmation of the expected relationship also refers to convergent validity. Convergent validity tests that

where constructs that are theoretically expected to be related, are related, and discriminant validity tests situations in which constructs that should have no relationship, in fact, do not have any relationship.

Factorial validity relates to the extent to which a set of measures accurately represents the research construct (Barki & Hartwick 1994). The loading of factors in relation to the construct provide evidence to support the construct validity of the instrument.

In Table 4.7 the correlation between the total scores of the organizational culture questionnaire on the one side, and job satisfaction, employee engagement, organizational commitment and intention to quit, on the other are presented.

Table 4.7
Correlation matrix

	Organizational Culture			
	Involvement	Consistency	Adaptability	Mission
Organizational commitment	r = .488 p < 0.001	r = .548 p < 0.001	r = .425 p < 0.001	r = .491 p < 0.001
Employee engagement	r = .419 p < 0.001	r = .521 p < 0.001	r = .286 p < 0.001	r = .501 p < 0.001
Job satisfaction	r = .495 p < 0.001	r = .680 p < 0.001	r = .465 p < 0.001	r = .546 p < 0.001
Intention to quit	r = -.399 p < 0.001	r = -.441 p < 0.001	r = -.267 p = .001	r = -.444 p < 0.001

From the literature the following relationships were expected:

- Organizational culture and job satisfaction are expected to correlate positively, based on the findings of Goldston (2007). The findings as contained in table 4.7 supports this expectation and positive correlation between all four constructs of organizational culture and organizational commitment is demonstrated. The Consistency construct has the strongest positive impact on job satisfaction.
- Organizational culture and employee engagement is expected to correlate positively, based on the findings of Denison (2010). The results of this research bear this out with all four constructs of organizational culture showing a positive correlation with employee engagement. The Adaptability construct exhibits the weakest impact between on employee engagement.
- Organizational culture and organizational commitment is expected to correlate positively, based on the findings of Taylor *et al* (2008).The results in table 4.7 also show positive correlation between organizational culture and organizational commitment with the Consistency construct contributing the strongest impact on organizational commitment.
- Organizational culture and intention to quit is expected to correlate negatively, based on the findings of Carmeli (2005). The results of this research as contained in table 4.7, also demonstrate a negative correlation between organizational culture and intention to quit with the Adaptability construct impacting the least on the intention to quit measure.

In total, 16 correlation coefficients were calculated to identify the impact of organizational culture on organizational commitment, employee engagement, job satisfaction and intention to quit. Out of the 16 correlation coefficients, 12 were positive and the remaining 4 negative. All of the positive and negative relationships were statistically significant with p-values less than 0.05. Organizational culture showed the strongest positive correlation with job satisfaction

The relationships were as expected. This would suggest concurrent validity.

With regard to factorial validity, the expectation was that the items ordered together by the authors (creating different sections in the questionnaire) should correlate more

strongly with the items in their own section than with items in other sections of the questionnaire. The authors of the Denison Organizational Culture Survey questionnaire suggest that there are four factors making up the questionnaire. In Table 4.8 the 24 items were forced into a four factor solution. Validity information in this regards was, as stated in Chapter 3, generated using a principle component analysis and a Varimax rotation was performed to help in the interpretation of the components.

Table 4.8
Factor analysis

Factor number	Factor1	Factor 2	Factor 3	Factor 4
Factor name	Involvement	Consistency	Adaptability	Mission
Item / number in test				
1 / 102	.750			
2 / 103	.594			
3 / 104	.680		.474	
4 / 105	.710			
5 / 106	.476			
6 / 107	.777			
7 / 108	.791			
8 / 109			.477	
9 / 110		.655		
10 / 111		.610		
11 / 112		.583		

12 / 113		.687		
13 / 114		.823		
14 / 115		.708		
15 / 116				.435
16 / 117				0.599
17 / 118			.739	
18 / 119			.757	
19 / 120			.756	
20 / 121			.489	
21 / 122	.513		.538	
22 / 123				.712
23 / 124				.576
24 / 125		.544		.425

From Table 4.8 we can observe that factor 1, Involvement, consisted of items 1 to 7. Item 7 should have formed part of factor 2, i.e. Consistency. Since items 1 to 6 loaded on the factor that they were supposed to load on, it can be surmised that factor 1, Involvement, therefore represents a clear theoretical factor.

Item 8 loaded on the Adaptability factor instead of the Consistency factor but the rest of the items (10 to 13) formed part of the Consistency factor that it was meant to load on thereby suggest strong support for the Consistency factor.

Factor 3 consisted of items 3, 8, 17, 18, 19, 22, 21, and 22. Item 3 forms part of the Involvement factor, item 8 the Consistency factor and items 20, 21 and 22, the Mission

factor. Only items 17, 18 and 19 loaded correctly on the Adaptability factor. This suggests moderate support for the Adaptability factor.

Items 15 and 16, which should have loaded on the Adaptability factor, loaded on the Mission factor together with items 22, 23 and 24. Item 15 “Customer input directly influences our decisions” and item 16 “All members have a deep understanding of customer wants and needs.” could be seen to represent core values of the organization and hence logically form part of the Mission factor.

The least support is shown for factor 3, Adaptability, with only 2 of the possible 6 items loading correctly on this factor.

The strongest support is evident for the Involvement factor with all 6 items loading on the Involvement factor that it is purported to measure.

4.6 Chapter summary

In this chapter the aim of the empirical study was discussed and the research hypotheses were set. The way the sample was collected was described and the five questionnaires that were used were discussed in terms of its psychometric characteristics. The statistical calculations were lastly discussed, with specific reference to the cut-off scores

CHAPTER 5: DISCUSSION, CONCLUSIONS, AND RECOMENDATIONS

In this chapter the results of the study will be discussed and conclusions will be drawn. This will be done by firstly focusing on what was found in the literature and then the empirical results will be discussed. This will be followed with a discussion on the extent to which the research goal was achieved. As stated in Chapter 1 the specific goal was to adapt and evaluate a measure of organizational culture in the mining industry in South Africa. Recommendations will be made regarding the use of the measure and the chapter and the study will be ended off with a discussion of the limitations of the study and recommendations for future research.

5.1 Discussion of results pertaining to the literature review

As set out in Chapter 1 eight goals were to be achieved with the literature review, as set out in the eight steps listed under the heading 1.6.1. The success in achieving these will be discussed individually.

- 1 To define the concept from several perspectives. In Chapter 2, under the heading 2.1, five definitions of organizational culture were found in the literature. The goal in this part of the research was to come to a thorough understanding what is meant when the word organizational culture is used. The operational definition adopted after reviewing all the definitions was Denison's definition of organizational culture and included constructs such as Involvement, Consistency, Adaptability and Mission.

- 2 To describe how the concept relates to other variables. It can be read in Chapter 2.2 that several theories or models exist around organizational culture. These include Hofstede's national culture theory (1980), Schein's (1985) organizational theory and model of culture and Denison's (1990) organizational culture model. The model found most suitable for this research was Denison's (1990) organizational culture model. The adapted Denison's organizational culture survey was used to determine measures for organizational culture in South

African organizations. The reason for its selection is that the Denison's Organizational Culture Survey has been used in several settings and reliability and validity studies have been conducted on the instrument (Cho, 2000). Its applicability has been established in Russia (Denison *et al* 2003) and in Iceland (Gudlaugsson & Schalk 2009).

The Denison's Organizational Culture Survey has been validated by Cho (2000) and in South Africa by Davidson (2007). It was readily available at no cost to the researcher.

- 3 To compile several lists of the elements, if any, of which the concept comprises. Here the objective was to identify the building block of the concept. The goal was to find the elements that needed to be included in the measure. It was found that organizational culture could be broken down into four constructs, each of which comprised 3 indices. In the DOCS (Denison *et al* 2006), the Involvement construct consists of three indexes: Empowerment, Team Orientation and Capability Development. The Consistency trait consists of: Core Values, Agreement and Coordination and Integration. The Adaptability trait consists of the three indices of: Creating Change, Customer Focus and Organizational Learning. The Mission trait consists of the indices of: Strategic Direction and Intent, Goals and Objectives and Vision.
- 4 To write notes on the validity and reliability of a psychometric measure, and the characteristics of a good measure and its items. This was achieved and notes were written. The different forms of internal validity that were discussed were face validity, content validity, criterion validity and construct validity. The five types of reliability that were distinguished and presented were test-retest reliability, equivalency reliability, split-half reliability, internal consistency reliability and interrater reliability.
- 5 To list measures and describe the measures of organizational culture. Several measures were found, namely the Competing Values Framework (CVF) originally

presented by Quinn and Rohrbaugh (1983), the Organizational Culture Inventory (OCI) developed by Cooke and Lafferty (1987) (cited in Balthazard *et al* 2006) and The Human Factors International's (2004) Organizational Culture Questionnaire (OCQ).

6 To describe how the measures relate to the elements of the concept. The measure of Denison's Organizational Culture Survey was found to be most suited and measured the construct as defined by Denison (2006). These results can be read in Chapter 2.6.

7 To describe how measured concept relates to other variables. It can be read in Chapter 2, under the heading Criterion-related validity of the Denison Organizational Culture model measures (heading 2.7) that organizational culture relates or correlates with several other variables.

This includes findings of research conducted by Denison and Mishra (1995) which indicated several relationships between culture and performance. The research of the relationship between organizational culture and employee engagement (www.denisonculture.com, 2010), revealed that firms with low scores on culture also had lower engagement scores and organizations with strong culture scores had higher engagement scores.

A study by Goldston (2007) reported significant associations between the traits of organizational culture (Mission, Involvement, Adaptability, Consistency) and facets of job satisfaction (satisfaction with pay, satisfaction with coworkers, satisfaction with supervision, satisfaction with opportunities for advancement, satisfaction with work itself and general job satisfaction).

Carmeli (2005) studied the relationship between organizational culture and withdrawal intentions and behavior. The results of this study indicated that employees' withdrawal behavior and intentions are partly related to an organizations culture. An organization culture that provides challenging jobs reduced employees' absenteeism and withdrawal intentions.

A study of the impacts of organizational culture, human resource management and top management orientations on employee commitment in multinational

corporations (Taylor *et al* 2008) reported that an organizational culture characterized by high adaptability was found to have a significant and direct effect on employee commitment.

- 8 To suggest the selected of measure or pool of items to be considered as a measure of the concept. A pool of twenty four items was selected. These items were the items included in the measure and were the items used in the empirical study.

From the aforementioned it is clear that literature related goals of the study were largely achieved. The exception was goal six, where finding information on the construct validity of the Denison's organizational culture survey within the South African context was a problem. Also, finding literature at goal seven was difficult. This could be considered as limitations of the study.

5.2 Discussion of results pertaining to empirical findings.

Several goals were set for the empirical study in Chapter 1. These were described under heading 1.6.2.1. The results pertaining to these goals will be discussed individually.

- 1 To compile a list of items to be to be tried out in the empirical investigation. This was achieved taking into consideration the reviewed literature and after consultation with the fellow students and the study leader. The questionnaire as it was used is an attachment to this document
- 2 To compile a battery which include items of this concept and combine that with other questionnaires. This was done and the adapted Denison Organizational Culture Survey, amongst others, was included in the battery.
- 3 To send the battery to a language editor and ask him/her to make specific comments on face validity. This was done and minor linguistic modification of the

questionnaire was done. The result was an easy to read questionnaire with some face validity.

- 4 To decide on a population to administer the battery on in order to determine its psychometric characteristics. The population consisted of two thousand and thirty five people within Exxaro Resources (N=2035), one thousand and forty eight people within Sasol Mining (N=1048) and two thousand, nine hundred and sixty three people within Lonmin (N=2963). The procedure used to draw the sample was discussed in Chapter 3.5. A total of fifty people from Exxaro Resources, forty six people from Lonmin and fifty one people from Sasol Mining were included in the sample. The descriptive statistics reveal that the number of males was 83 (56.5%) and the number of females was 64 (43.5%). The race composition of the sample was as follows; there were 50 black people (34%), 15 indian people (10%), 3 colored people (2%) and 79 (54%) white people.
- 5 To gain consent from the participants and administer the battery. All participants participated voluntary and they were informed about their rights as participant and the purpose of the research. The consent forms handed to each participant can be seen in Annexure A.
- 6 To capture the data on an Excel spreadsheet. This was done in groups of two students in order to eliminate punching errors.
- 7 To eliminate items based on their low correlation with construct (correlation matrix) or factor analysis, and high levels of gender and race bias. It can be read from Table 4.1 that four items had a relatively low correlation with the total score. The results as depicted in Table 4.2 reveal that eight items did not load on the expected factors. In Table 4.3 the results reveal that there is no gender bias and in Table 4.4 it can be read that eight items showed race bias. In the summative table, Table 4.5 it can be seen that eleven items had “defaulted” or showed less disabling psychometric characteristics in more than one area. As this number was small, it was decided to stick to the suggested measure as proposed originally.

- 8 To determine reliability of the shortened questionnaire. This was done for the full measure, as the proposed measure was not shortened. The reliability coefficients for the individual constructs are as follows: Involvement .832; Consistency .742; Adaptability .789 and Mission .677; the total reliability coefficient for all the constructs is .903. The coefficients for the Consistency, Adaptability and Mission constructs are low based on the guideline of .80 set out in chapter three (cf. Spatz & Kardas 2008). The reliability of the questionnaire was Cronbach alpha = .93 This coefficient is it acceptable at the guideline of .80 (cf. Spatz & Kardas 2008) and it may thus be concluded that the adapted Denison Organizational Culture Survey questionnaire shows sufficient internal consistency to be regarded as reliable for use in a South African mining industry
- 9 To determine the correlation between measured concept and other concepts measured and identified in the literature review. The correlation between the organizational culture and organizational commitment ranged from .425 to .591 for the four constructs ($p < .001$), employee engagement ranged from .286 to .521 ($p < .001$), job satisfaction ranged from .465 to .680 ($p < .001$), and intention to quit ranged from -.267 to -.444 ($p < .001$).

From the literature the following relationships were expected:

- Organizational culture and job satisfaction are expected to correlate positively, based on the findings of Goldston (2007). The findings as contained in table 4.7 supports this expectation and positive correlation between all four constructs of organizational culture and organizational commitment is demonstrated. The Consistency construct has the strongest positive impact on job satisfaction.
- Organizational culture and employee engagement is expected to correlate positively, based on the findings of Denison (2010). The results of this research bear this out with all four constructs of organizational culture showing a positive correlation with employee engagement. The Adaptability construct exhibits the weakest impact between on employee engagement.

- Organizational culture and organizational commitment is expected to correlate positively, based on the findings of Taylor *et al* (2008). The results in table 4.7 also show positive correlation between organizational culture and organizational commitment with the Consistency construct contributing the strongest impact on organizational commitment.
- Organizational culture and intention to quit is expected to correlate negatively, based on the findings of Carmeli (2005). The results of this research as contained in table 4.7, also demonstrate a negative correlation between Organizational culture and intention to quit with the Adaptability construct impacting the least on the intention to quit measure.

In cases where the concept theoretically consists of subcomponents, factor analysis was done to report on the factorial validity of the shortened measure. The data in Table 4.8 shows that all items loaded correctly on the Involvement factor, four items loaded correctly on the Consistency factor, three items loaded correctly on the Adaptability factor and four factors did not load correctly for the Mission construct. It can hence be surmised that overall, factorial validity is suggested for the shortened measure.

- 10 To discuss the utility of the questionnaire for future use. It was established that although most of the scales that had reliabilities lower than the set .8 minimum, the overall reliability of the questionnaire was .93. This would indicate that the questionnaire and the reliability for its use in a South African mining industry reflect statistically significant internal consistency. The calculation of sixteen correlation coefficients demonstrated the concurrent validity of the questionnaire, and the computation of factorial validity indicated that the set of measures adequately represented the research construct. Based on the reliability and validity as determined in this study, the use of the adapted Dennison Organizational Culture Survey would be encouraged in South African mining sector.

5.3 Conclusions

All the goals of this study, as set out in Chapter 1.3 were achieved. The resulting measure of organizational culture is now available for use in the mining industry. More knowledge reliability of the measure and the validity thereof is now available. Also norms for a mining industry population (see Table 4.6, Descriptive statistics) are now available. This will allow for the more confident use of the measure.

5.4 Recommendations

It is recommended that the measure be used in the mining industry. Although it is always advisable to use the results of any measure conservatively, the fact that the construct correlates significantly with major constructs such as organizational commitment, employee engagement, job satisfaction, and intention to quit, make the use thereof advisable. It may provide managers valuable information about the state of their work environment and may contribute to the scientific management of the workforce. Organizations that are in the process of change may find that determining the organizational culture of the organization is imperative to ensuring the success of their change initiative since it is very important that a concept that needs change be observable or even measured, otherwise it cannot be manipulated. Apart from the need for change managers may find that there is importance in relating this concept to other organizational activities such as productivity and quality, knowledge sharing and transfer and employee attitudes.

5.5 Limitations and recommendations for future studies

The limitations and recommendations for future studies are presented below under two separate sub-headings.

5.5.1 Limitations

The primary limitation of the study was the sample. In this research data was collected from three sites. It is therefore difficult to generalize within the industry and it would be irresponsible to generalize outside the industry.

A second limitation is with regard to the measuring instrument itself. Although the measure has high face validity, it can be observed that race bias is evident in the response to some items. This may suggest that applying the measure to all groups may not be just and contrary to the South African employment equity legislation. Caution is thus advised.

Another limitation of the study was the quality of the literature review. Particular difficulty was experienced in the section on goal six, where finding information on the construct validity of the Denison's organizational culture survey within the South African context was a problem. Also, finding literature on the correlations with organizational culture and organizational commitment, employee engagement, job satisfaction, and intention to quit, at goal seven was difficult. This could be seen as limitations of the study and if future researches could improve on those sections, the quality of this research would also be enhanced.

5.5.2 Recommendations for future studies

As this research was conducted from three sites in the mining industry, it is suggested that including more sites in future research will be beneficial. This approach will result in wider generalizability within the industry.

A second recommendation would be to investigate race bias in greater detail. This may yield interesting results and provide a better understanding of differences between individuals.

Also, the sample of the mining companies was an opportunity sample and the recommendation for future research is to utilize a randomization process in order to

select the companies. This may results in results that have a higher degree of generalizeability within the industry

Furthermore the exclusion criterion of education level should be revisited. Since the nature of mining industry is that a large portion of its work force is comprised of unskilled labour, including them into the survey may result in a better understanding of the differences in the perception of organization culture at different levels in the organization.

5.6 Chapter summary

In this chapter the results were discussed and conclusions were drawn. Some recommendations were also presented. From this it was evident that measure may be valuable for use in the mining industry. As all the research goals were achieved, this concludes the study. In the following pages the references are presented as well as the annexures.

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ANNEXURE A CONSENT FORM

Human resources management practices and attitudinal outcomes

CONSENT TO PARTICIPATE IN RESEARCH

You are invited to participate in a research study conducted by several MBL students and Prof Renier Steyn (PhD, DLitt et Phil), from the University of South Africa. This research forms part of my studies towards a master's degree in business leadership.

Please read the following and decide whether you are interested in participating in the study. You will be included in this study only if you are willing to participate voluntarily.

PURPOSE OF THE STUDY

The purpose of this study is to investigate the influence of human resources management practices on attitudinal workplace outcomes. This kind of research is important as it will lead to the identification of the specific practices that influence attitudes, and this may result in allocating resources to the areas where they will have the greatest positive impact.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by legislation (The Mental Health Care Act, Act 17 of 2002). Confidentiality is not a concern in this research as the tests will be answered anonymously and individual identifiers will not be requested. The data will be destroyed on completion of the study.

PROCEDURES

Should you volunteer to participate in this study, we would like you to complete 13 questionnaires. In total they consist of 183 questions, and contain questions on human resources management practices and workplace attitudes. The duration of the session is approximately 90 minutes. Your participation will involve the completion of the questionnaires and nothing more. You are free to refuse to answer any questions or to withdraw from the process at any stage.

POTENTIAL RISKS AND DISCOMFORTS

There are no foreseeable physical or psychological risks involved in participation. You will be mildly inconvenienced by the time it takes to complete the questionnaires (30 minutes). If you would like to discuss the research and your reactions to the questionnaires, you are welcome to do so after the session.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

You will not benefit directly from your participation in the research. The results of the research will, however, be of scientific and practical value in understanding how people react to current human resources management practices. The research results may improve the quality or change the emphasis of human resources management practices, and through association improve work attitudes and performance.

PAYMENT FOR PARTICIPATION

You will receive no payment for your participation.

PARTICIPATION AND WITHDRAWAL

You can choose whether or not you wish to be a participant in this study. Should you volunteer to be a participant in this study, you may withdraw at any time without any repercussions whatsoever.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact:
Prof Renier Steyn, 079 227 3984, steynr@unisa.ac.za

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and cease participating without any penalty. You are not giving up any legal rights because of your participation in this research study. If you have questions regarding your rights as a research participant, you may contact the Health Professionals Council of South Africa, Post Office Box 205, Pretoria, South Africa, (012) 338 9300 or any of the ethics committees of the University of South Africa.

SIGNATURE OF RESEARCH PARTICIPANT

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study.

Kindly note that you will not be required to sign this declaration, but that you will be indicating your consent by completing the answer sheet. (A signed copy is not required, as this may identify you, and this research is done in such a way that you cannot be identified after participating in this study.)

Annexure B Adapted Denison Organizational Culture Survey

Biographical data

Indicate the appropriate option by making an X on the appropriate number.

Eg. Are you human?

[X]Yes [2]No

Gender

[1]Male [2] Female

D

Race

[1]Black [2] Indian [3] Coloured [4] White

E

On what organizational level do you work?

[1] Administrative / support

[2] Supervisory

[3] Middle management / professional

[4] Senior / executive management

How long have you been working for this organisation? Answer: ____ years

Age? Answer: ____ years

Total number of employees in company: _____

Section Oc

102 Information is widely shared so that everyone can get the information he or she needs when it is needed.

DG

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

103 Business planning is ongoing and involves everyone in the process to some degree.

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

104 Co-operation across different parts of the organisation is actively encouraged.

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

105 People work like they are part of a team.

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

106 Authority is delegated so that people can act on their own.

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

107 There is continuous investment in the skills of employees.

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

108 The leaders and managers 'practice what they preach'.

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

109 There is an ethical code that guides our behaviour and tells us right from wrong.

[1]Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

110 When disagreements occur, we work hard to achieve 'win-win' solutions.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

111 It is easy to reach consensus, even on difficult issues.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

112 People from different parts of the organisation share a common perspective.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

113 It is easy to co-ordinate projects across different parts of the organisation.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

114 The way things are done is very flexible and easy to change.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

115 New and improved ways to do work are continually adopted.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

116 Customer input directly influences our decisions.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

117 All members have a deep understanding of customer wants and needs.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

118 We view failure as an opportunity for learning and improvement.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

119 Learning is an important objective in our day-to-day work.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

120 There is a clear mission that gives meaning and direction to our work.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

121 There is a clear strategy for the future.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

122 Leaders set goals that are ambitious, but realistic.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

123 The leadership has 'gone on record' about the objectives we are trying to meet.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

124 We have a shared vision of what the organisation will be like in the future.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

125 We are able to meet short-term demands without compromising our long-term vision.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly agree

End
Thank you for your cooperation