AN EVALUATION OF RESPONSE SCALE FORMATS OF THE CULTURE ASSESSMENT INSTRUMENT

by

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Declaration

I declare that the dissertation submitted by me for the degree, Doctor in Philosophy (Leadership in Performance and Change) at the Rand Afrikaans University, is my independent work and has not been submitted by me for a degree at another faculty or university.

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Stanley Andrew Smith
November 2002

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SYNOPSIS

Aim of the study

The aim of the study was to evaluate the nature of organisational culture and the most effective response scale for assessing organisational culture. The study also aimed to establish which response scale format would yield the best metric characteristics for use in organisational culture instruments. The range of response scale in the study were four, five and six-point scale.

The literature survey

A literature survey was conducted. The concept *"culture"* was found to have common characteristics with descriptions of culture at national and organisational levels. The national culture was found to influence organisational culture. Organisations doing business across borders needs to accommodate national culture in their business practices. Organisational culture has a variety of theoretical models from which the practitioner is able to choose. For an organisational model of clutter to be useful in the development of culture instruments, such a model should represent the common understanding of what cutlet is by all in the organisation and be integrative. Furthermore, the model must allow for the profiling of the organisation so that a distinctive profile maybe obtained after the measurement of the culture.

Organisational culture models, to be useful for the measurement of culture need to accommodate the levels of culture and their respective elements. The levels including artefacts, beliefs and values and underlying assumptions. Another organisational variable that required attention, is that of time. An integrative model of organisational culture is proposed.

The concept of measurement and the four levels are elaborated upon. The levels are related to the measurement scales. A table is provided to facilitate the choice of levels of measurement that would allow the choice of levels of measurement with the scale that would allow the largest choice of statistics. Some of more time and cost effective scales are briefly described. The main finding was that continuous scales in

the form of intensity scales are most useful for organisational measurement. The challenges of using response scales are outlined. Various biases and their effects are outlined ranging from the halo effect to prestige bias.

The metrics of scales are outlined that would be useful in the development of organisational culture measures.

Design considerations of instrument are elaborated upon. Well-designed instruments tend to have specific objectives, clear questions, are valid and reliable and related to specific needs. A design process is recommended for the development of culture instruments. Specific guidelines for the development of questions are provided ranging from the asking of purposeful questions to the relevance of questions. Working effects are also included in the development of items. Wording effects range from the avoidance of abbreviations, slang, colloquial expressions or jargon to the effects of hidden assumptions. User friendly design of instruments is briefly outlined including the ordering of questions and layout.

The empirical study

Data from various organisations were analysed where the respective response scales had been used in the Culture Assessment Instrument (CAI). Data were aggregated for the respective scales with the expectation that large samples would yield useful information. Descriptive statistics, factor structure and reliabilities were obtained from each of data sets.

All three data sets, after analysis, loaded on one factor after being factor anaysed. High reliabilities were obtained from each of the data sets. All the data was positively skewed.

The initial results obtained indicated that each of the data sets had construct validity and were reliable. After a comparison of the respective reliabilities, no one respective response scale could be identified as being superior. The results are attributed mainly to the nature of the sample, the design of the scales and the nature of the formula used in the calculation used in the calculation of Cronbach Alpha.

Recommendations, contributions and limitations of the study

Recommendations are made from methodological, theoretical and practical perspectives.

The contribution of the study includes the development of a process for the development of instruments; guidelines for the development of instruments and the choice of a response scale that would contribute to the metrics of instruments.

Limitations of the study were identified and outlined. The main limitation was the use of secondary data and the effects of not having standard biographical data available for all three data sets.

Recommendations for future research are made.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

1.1. Introduction

Contemporary research (Cummings, 2001; Denison, 2001; Dove, 2001; Flamholtz, 2001; Nadler, Thies & Nadler, 2001) has shown that organisational culture is perhaps the single best predictor of organisational performance. However, poor measurement instruments of culture would yield poor data that renders best management interventions useless. Common pitfalls in this regard are the choice of response scale formats (Nunnally & Bernstein, 1994; Schepers, 1992; Swart, Roodt & Schepers, 1999), and wording of items (Petty, Rennier & Cacioppa, 1987; Schepers, 1992).

This chapter introduces the problem of the study. More specifically the following areas are outlined: the setting of the problem, the motivation for the study, the research problem, the research objectives and postulates, the research design, the value of the research, and an outline of the remaining chapters.

1.2. Setting of the problem

Change in the business environment forces organisations to reorganise. New technology, changing customer needs and expectations forces adaptation to the new order. For that reason, organisations need to change their culture to address and meet competitive demands. Organisational culture is a multifaceted phenomenon, faced by all organisations. How organisational culture influences the management process is not always clear (Cummings & Worley, 1997; Prinsloo, 2001). Organisations are required to adapt to the uncertainties and chaos brought about by globalisation, information technologies and management innovation. Managers are actively changing their organisations to revitalise business, refocus their strategies and realign their structures and processes to the new strategies. The change brought about by these initiatives has led to changes in the underlying assumptions and values prevailing in the organisations. The changed way of doing things is necessary

to survive and can be relevant to their stakeholders in future (Cummings & Worley, 1997).

Change in organisations is informed by the changes and challenges heralded by the changed political situation in South Africa since the early 1990's. Managers have to manage the diversity of issues introduced by legislative requirements. Adapted business practises are designed to address language, creed, gender and disability. Different cultures need to be assimilated into organisational cultural milieu of the organisation (Dombai, 1999).

Organisations have to adapt to become more efficient (Hammer, 1996; Johansson, McHugh, Pendelburry & Wheeler, 1993). Companies, as part of their strategy to grow their businesses, have embarked on acquiring or merging with other businesses. Some organisations as part of their acquisition strategy often focus their attention on the financial indicators, ignoring the cultures of the organisations to be merged. Managing the cultural elements of the organisation will contribute to the effectiveness of the acquisition and integration of the business (Hubbard, 2001). The advent of the Internet and its influence on e-business has added to the changes organisations need to deal with (Champy, 2002).

As the business landscape changes, new opportunities are identified. New businesses are established as part of the effort to create value for shareholders (Goldberg, 1999; Stern, Shiely & Ross, 2001). Some organisations have developed new strategies as part of their strategic thrust for the new millennium (Goldberg, 1999; Kaplan & Norton, 2001).

The establishment of new businesses requires the services of organisational members. New organisational members need to be socialised into and aligned to the strategy and objectives of the new organisation, especially where members are recruited from a holding organisation. The organisation ventures require organisational behaviour that would result in superior performance, which translates into organisational results (Goldberg, 1999).

Hofstede (2001) has done significant research on cultures across 50 countries. He has identified five dimensions of culture: power distance; uncertainty avoidance; individualism versus collectivism; masculinity versus femininity; and long term versus short-term orientation. While the work focused on the national cultures, it did give attention to organisational cultures. He provides insights into the interfaces between organisational cultures as found in terms of migration, international politics, developmental operation and mergers and alliances. The work appears particularly useful for those organisations that wish to establish offshore operations.

In the South African context, Martins and Martins (2001a; 2001b) indicated that organisational culture surveys are one of the mechanisms to monitor performance in an organisation. To establish those areas that need change, organisational surveys are required (Cummings & Worley, 1997). Organisational surveys are also useful tools to implement changes and facilitate the process of change (Church & Waclawski, 1998; Hubbard, 2001; Wagner & Spencer, 1996).

The design of response scales used in survey instruments have an impact on the statistical analysis of the data obtained (Babbie & Mouton, 2001; Welman & Kruger, 2001). The response scale design determines which of the statistical procedures available may be used (Kerlinger & Lee, 2001; Welman & Kruger, 2001). The four, five and six-point response scales will be investigated in greater depth in this study.

1.3. Motivation or this study

Organisation Development Practitioners need to measure aspects of organisational culture as they facilitate change in organisations. To allow accurate and useful measurement, models from which surveys may be designed, are required (Church & Waclawski, 1998; Harrison & Shiron, 1999). The metric properties of such instruments are partially dependent on the scale format used (Kerlinger & Lee, 2001; Nunnally & Bernstein, 1994). The development of a model of organisational culture and by identifying the most useful response scale format, by identifying characteristics of well-designed instruments will add to the methods and techniques available to the Organisational Development Practitioner to effect change in organisations.

1.4. The aim of the study

The aim of this study is to examine the nature of organisational culture and the most effective response scales format for assessing organisational culture in quantitative terms. This research also aims to establish which response scale format would yield the best metric characteristics for use in an organisational survey instrument.

Organisational culture is an illusive area of study with many writers contributing to the field. It would be useful to have a model that would inform the measurement of organisational culture. The management of organisational culture remains important in the management of change and culture within an organisation.

1.5. Research objectives

The objectives of this study can be visualised at two levels, objectives for the literature survey and objectives for the empirical study.

1.5.1. Literature survey

The primary objective of the literature survey is to indicate the more salient areas of organisational culture, the need to study corporate culture, and the most effective manner to measure organisational culture.

The secondary goals are to:

- Outline the concept culture from anthropological, national and organisational perspectives.
- Describe models of organisational culture for the development of organisational culture instruments.
- Propose a model for corporate culture including the major domains of organisational culture.
- Describe the nature of measurement levels and the relationship to response scales.
- Outline the metrics required in instruments.

- Outline the features of a well-designed instrument.

1.5.2. The empirical study

The primary objective of the empirical study is to examine the features of measurement scales and their relative usefulness in survey instruments. The focus is on a comparison of three scales (four, five or six point response scales) that will provide the most reliable scale to assess organisational culture on the same group of items.

At the secondary level the objectives are to:

- Show the metric properties of a four-point response scale on an instrument.
- Show the metric properties of a five-point response scale on an instrument.
- Show the metric properties of a six-point response scale on an instrument.

1.6. Postulates

From the above stated empirical objectives, the following postulates for the empirical investigation are formulated:

1.6.1. Postulate 1

Four-point response scales would yield the poorest metric properties, compared to the five and six-point response scales.

1.6.2. Postulate 2

Six point response scales would yield the best metric properties, compared to the four and five-point response scales**.**

1.6.3. Postulate 3

Five point response scales would yield better metric properties that the four-point response scale, but worse that the six-point response scale.

1.7. Broad research design

The methodology of this study is non-experimental and *ex post facto* in nature. Secondary data sets were obtained from a consultant who had used the organisational culture instrument in a variety of organisations. The data sets obtained from the various settings were subjected to factor analysis and iterative item analysis. Since the sample sizes on all the response scale data sets are larger than 500, it is expected that the differential effects of the individual differences would be eliminated by sample size.

1.8. Value of the research

The value of the research is conceptualised from the methodological, theoretical and practical perspectives.

1.8.1. Proposed methodological value

Little research has been conducted on the metrics of different response scales in the field of organisational culture instrumentation. The five-point response Likert scale is used in the organisational culture instrumentation by many authors (Ashkanasy, Broadfoot & Falkus, 2000; Church & Waclawski, 1998; Van der Post, de Coning & Smit, 1997). There appears to be little appreciation for the limitations posed by the design of the Likert scale. Little attention has been given to response scale research in the context of organisational culture instrumentation in South Africa.

1.8.2. Proposed theoretical value

The process of designing survey type instruments is very similar (Church & Waclawski, 1999; Jones & Bearley, 1995; Rubin & Babbie, 1997). Various authors indicate the need to appreciate the importance, and stress the significance of appropriately designed response scales (Babbie & Mouton, 2001; Nunnally & Bernstein, 1994; Schepers, 1992; Swart et al., 1999). The study aims to highlight the significance of well-designed response scales.

1.8.3. Proposed practical value

The present study aims to contribute to the field by identifying the most effective response scale format for culture survey instruments and provide sound metrics for instruments that would provide sound metrics for instruments.

1.9. The outline of the remaining chapters

The content of the rest of the study will follow the following structure.

In chapter 2, organisational culture and design characteristics of organisational culture instrumentation are discussed. The focus of Chapter 3, will be on the research design and methodology employed. In chapter 4, the results of the study are reported. Finally, in chapter 5, the results, conclusions and recommendations of the study are reported.

1.10. Conclusion

In this chapter, a motivation for this study was presented. More specifically the following areas were outlined: the setting of the problem, the research objectives, postulates, the research design, motivation for the study, the research problems, the value of the research and an outline of the remaining chapters.

In chapter 2, organisational culture and issues pertaining to instrumentation design will be discussed in more depth.

Chapter 2

ORGANISATIONAL CULTURE AND INSTRUMENT DESIGN

2.1. Introduction

The previous chapter outlined the context and aims of the study. The present chapter deals with literature pertaining to culture and the development of organisation culture instruments. The review of the literature commences with the concept 'culture' in general, proceeds to the concept '*national culture'* and '*organisational culture'*. Models and theories of organisational culture are outlined. The metrics of instrumentation are described. Finally, the design of organisational culture instrumentation is outlined. As a whole, the chapter focuses on the salient areas of organisational culture and the manner in which to measure organisational culture.

This chapter provides the structure for the development for an organisational culture assessment instrument.

2.2. Culture

The earliest references to culture in the literature go back as far as 1887. The concept culture is represented in broad terms, is passed from successive generations through socialisation within communities (Kotter & Heskett, 1992).

The following definition indicates the universality of the concept culture:
"*the total of inherited ideas, beliefs, values and knowledge, which constitute the shared bases of social action*" (Collins Dictionary and Thesaurus, 1988, p. 237).

The definition emphasises the broad nature of the concept culture and the manner in which culture is passed on to members by social rewards and sanctions. The totality of the process is emphasised by the social nature of the transmission of everything that is important to a group.

Social anthropology has provided the framework for the development of what we currently understand to be organisational culture (Denison, 1990; Hatch, 1997; Kotter & Heskett, 1992; Ott, 1989). Kroeber and Kluckhohn (1952) have reviewed the concept culture and associated definitions. The work attests to the difficulties in defining culture. While considering over 100 definitions, none of the definitions were evaluated as acceptable. The commonality among the definitions is that there is learning and transmission of culture.

In the analysis of the definitions, Kroeber and Kluckhohn (1952, pp. 74 -79) have identified the concepts and elements found in the definitions. The broad concepts gleaned from their list may be categorised as follows: behaviours, beliefs, artefacts, language, patterns of behaviour and social action. It will be shown that these concepts have been assimilated into the literature on organisational culture.

A relationship between culture and behaviour exists making the study of culture possible. Culture is an abstraction from the behaviour exhibited by a particular community. Culture cannot be observed directly, culture needs to be inferred from what people say and do as well as the things they make that are functional in their environments (Beals & Hoijer, 1971).

The elements as identified by Kroeber and Kluckhohn (1952) and the assertion that culture is an abstraction, suggests that the elements are at different levels on a continuum. Some of the elements are explicit while much of culture is implicit. The continuum makes culture and related dynamics a challenge to research and report on.

2.3. National culture

Hofstede (2001) has done the most significant work on national cultures and their influence in multi-national organisations. He described national culture using a systems approach where those who belong to a particular grouping share a value system. The norms of the grouping or society have resulted in the development of institutions with particular functions. The institutions include among others, the family, education and political systems. The metaphor of mental programming is used to

describe the effects of culture as well as the crystallisation of all that has gone or happened before in the minds and hearts of the current generation. He uses the following representation, Figure 2.1 to explain national culture dynamics.

Hofstede's view of national culture presents a strong case for influence on organisational culture. The organisation is a society that has specific values, rituals, heroes and symbols peculiar to the group. Similar influences act on the culture of an organisation.

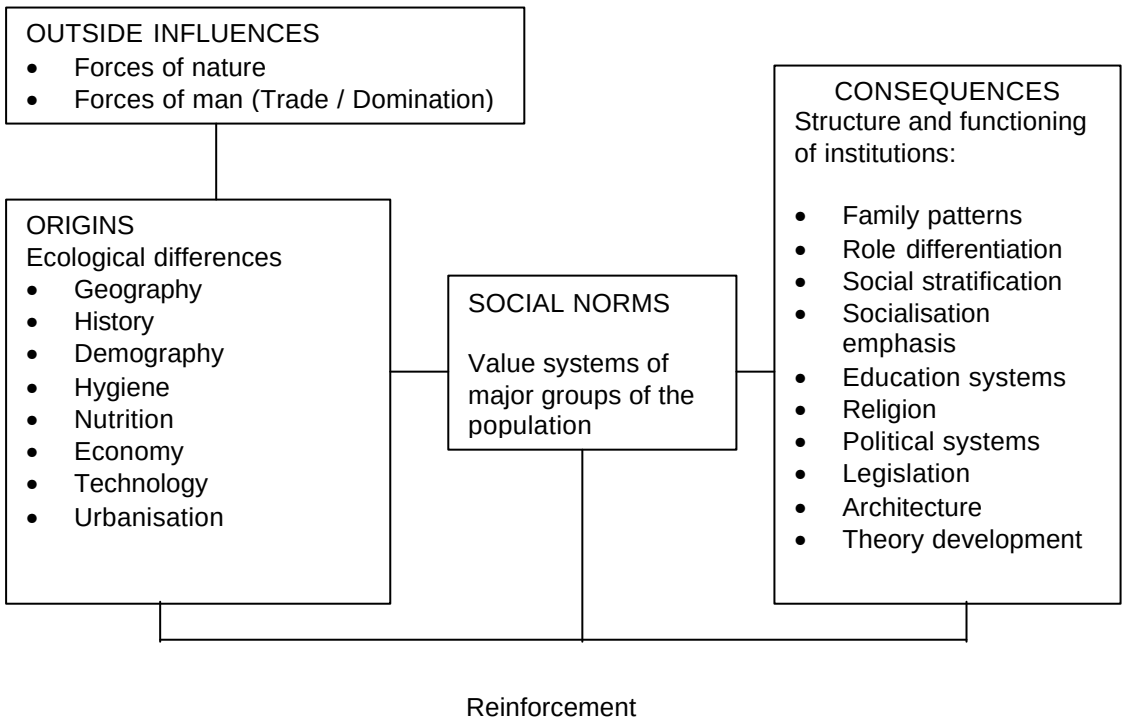

Figure 2.1: National culture dynamics

(Adapted from Hofstede, 2001, p.12)

As organisations aim to do business beyond their borders, there is a need to have compatible norms with the host country. Management practices are required to consider the host country's cultural norms in the development and management of new relationships in the host country to ensure effectiveness (McGrath-Champ & Carter, 2001). Thus when change interventions such as Total Quality Management are implemented plans should be adapted to accommodate culture indigenous to the country. Generic implementation strategies of Total Quality Management have not been effective (Sousa-Poza, Nystrom & Wiebe, 2000).

The influence of national or ethnic culture and the management of organisations are clear. National norms and culture affect organisational culture.

2.4. Organisational culture

Organisational culture will be discussed in terms of definitions and models.

2.4.1. Organisational culture as a study object

Since the early 1980's, organisational culture has received attention in the literature (Peters & Waterman, 1982). Many books appeared, focussing on the performance of organisations (Alvesson, 2002; Kotter & Heskett, 1992; Peters & Waterman, 1982). The attention in other books attempted to explain the competitiveness of Japanese organisations (Alvesson, 2002; Denison, 1990; Hatch, 1997; Ouchi, 1981).

The attention in the field stimulated attention to culture based to work originally done in the field of cultural anthropology (Denison, 1990; Hatch, 1997; Kotter & Heskett, 1992; Ott, 1989). Interest in the field of organisational culture has not waned in recent times (Alvesson, 2002; Ashkanasy, Wilderom & Pearson, 2000; Cooper, Cartwright & Earley, 2001; Martin, 2002).

2.4.2. Definitions of culture

The definitions below provide some insight into the diverse thinking on the concept of organisational culture. While the definitions have semantic differences, similarities exist. Of the definitions, the definition of Edgar Schein has received the most attention in the literature (Hatch, 1997; Ott, 1989).

"A pattern of 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, 1985, p. 9).

"Organisational culture can be defined as functionally or pragmatically as a social force that controls patterns of organisational behaviour by shaping members' cognitions and perceptions of meanings and realties, providing affective energy for mobilisation, and identifying who belongs and who does not" (Ott, 1989, p. 69*).*

"Culture refers to the underlying values, beliefs, and principles that serve as a foundation for an organisation's management system as well as management practices and behaviours that both exemplify and reinforce those basic principles. These principles and practices endure because they have meaning for the members of the organisation. They represent strategies for survival that have worked well in the past and that members believe will work again in the future" (Denison, 1990, p. 2).

Kotter & Heskett (1992, p. 4) defined organisational culture as*…"the totality of socially transmitted behaviour patterns, art, beliefs, institutions, and all other products of human work and thought characteristic of a community or population."*

The definitions above refer to social constructs that enable people to work together and include the social forces affecting the behaviours of organisational members. Organisational culture is the foundation of the behaviours, defined by the group and perpetuated by the group. Organisational culture manifests in the artefacts, values and assumptions held by the organisation. Organisational culture relies on shared meanings, understanding, values and beliefs systems or knowledge. The shared meanings, values and underlying assumptions distinguish one organisational culture from another.

For the purposes of this study, the following definition is proposed. Culture is the sum of socially constructed behaviours that serve an organisation. Culture is transmitted through a socialisation process to organisational members, shaping their meanings and perceptions as to what is acceptable in dealing with problems in their immediate contexts.

2.5. Models and theories of organisational culture

Models and theories help to explain the nature of organisational culture. Martin (2002) proposed a framework to view the models available. She proposed a three-tier approach to mapping organisational culture models. The levels are integration, differentiation and fragmentation. The integrated view allows for mutually consistent interpretations of culture, differentiation views allows for inconsistent interpretations of cultural actions, while fragmentation accommodates those cultural manifestations that are not clear or consistent in the manifestation in the organisation (Martin, 2002). The framework facilitates the understanding or organisational behaviour in different contexts.

Models are useful in the measurement of organisational of culture. Askanasy et al., (2000) suggested a classification of organisational measures based on the typing or profiling of organisational measures. The choice of model is informed by the purpose of the survey and the outcomes required (Askanasy et al., 2000; Church & Waclawski, 1998; Kozlowski & Klein, 2000; Jones & Bearley, 1995). Models need to be compared against the frameworks provided by Ashkansy et al., (2000) and Martin (2002) to ensure that useful parameters are set for organisational culture research. The models and theories presented below aim to provide examples of the models that would be useful in the development of organisational culture instruments.

2.5.1. Model of organisational culture and effectiveness

Denison (1990) referred to culture as those underlying values, beliefs and principles that inform the management system of an organisation. Culture includes management practices and behaviours in the organisation that support those principles. He emphasised and illustrated the relationship between culture and organisational effectiveness in terms of those persons in the organisation, the environment and the policies and practices within the organisation. The relationships between these elements are further influenced by factors such as involvement of members, consistency of practices, adaptability of members and the organisation and clarity of the mission. The elements of this model are graphically illustrated below:

Points of reference	External environment of the organisation	**Adaptability**	**Mission**
	Internal environment of the organisation	**Involvement**	**Consistency**
		Change and flexibility	Stability and direction

Figure 2.2: Organisational culture and effectiveness
(Adapted from Denison, 1990, p. 15).

In the model, involvement and consistency focus on the internal environment of the organisation. Adaptability and mission focus the organisation on the external environment of the organisation. Involvement and adaptability as elements may be linked to represent the organisation's capacity for flexibility and change. Contrasted are mission and consistency, representing the organisation's capacity for stability. A system orientated towards adaptability and involvement is more likely to introduce a variety of inputs and solutions to situations than when a system is oriented towards high levels of consistency and mission. A bias towards consistency and mission are likely to reduce variety. An effective organisation is able to balance all four elements within its organisational culture.

2.5.2. Symbolic-interpretative organisational theory

Hatch (1997) proposed a symbolic-interpretative approach to studying organisational culture. The symbolic-interpretative approach is considered a social construction. The construction depends on the interpersonal definition and agreement by members of an organisation. The social reality exists for as long as members agree that social entities exist and act appropriately. Organisational members participate in organisational life by creating, using and interpreting symbols. Organisational members are also sensitive to the interpretative pronouncements made by others. The utilisation of organisational symbols allows organisational members to create and perpetuate their own culture. It is through the observation of symbol creation that

culture is observed and interpretable by the researcher. By searching for the essential symbols and establishing an indigenous interpretation, an understanding of the culture is gained.

Researchers focus their attention on specific members of a culture to establish members' experiences and memories. The purpose is to establish the perspectives applicable to the culture as a whole. The interpretations represent the view of all members of the culture, in an integrative manner. The view is representative of all the complexities present in the culture. To obtain the interpretative view, the experiences are collated to form a cultural pattern. The patterns are then recognisable to the members or those who are close to the culture (Hatch, 1997).

In the context of symbolic-interpretative approach, symbols are any conscious or unconscious association with a concept or meaning. The symbols consist of a tangible form and are endowed with wider meaning than is immediately apparent. Symbols are evident in different forms, and are loosely classified into physical objects, behavioural events or verbal expressions (Hatch, 1997).

Interpretations are critical to the symbolic-interpretative approach. Symbols are considered inherently ambiguous. Different organisational members attach different meanings to the same symbol. Members could also use different symbols to portray the same meaning. While organisational members may give symbols different interpretations, members are influenced by similar outside events or persons. Interpretations do not occur in a vacuum, the interpretations are informed by the social construction by the participants in the culture (Hatch, 1997).

2.5.3. Levels and domains of organisational culture

Organisational culture manifests on a continuum, from being concrete and visible to being subtle and invisible. As suggested by Schein (1985; 1991; 1999), there are different levels of culture. Schein's Model has influenced most of the thinking in the field since it was first proposed (Hatch, 1987; Martin, 2002; Ott, 1989).

At each of the levels or domains, various elements are located. The more obvious or concrete and visible manifestations of culture are artefacts (see Figure 2.3).

Schein (1985) identifies three levels of culture, artefacts, values and basic assumptions (See Figure 2.3).

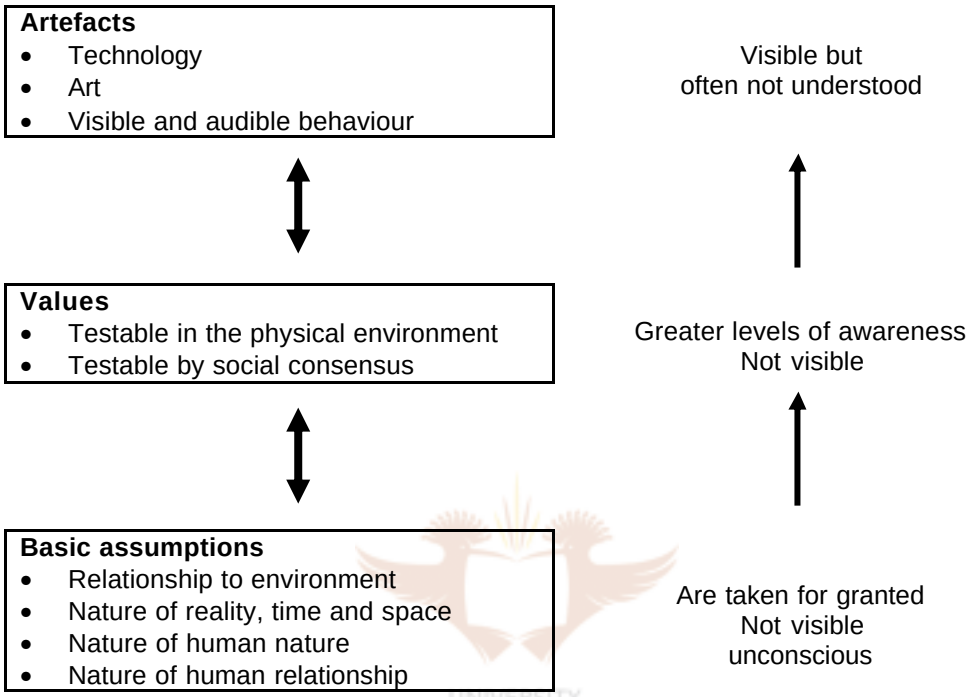

Figure 2.3: Schein's levels of culture

(Adapted from Schein, 1985, p.14).

2.5.3.1. Artefacts

Level one of Schein's (1885) organisational culture, relates to artefacts. Artefacts are conscious, obvious expressions of culture. Artefacts are visible, tangible and audible demonstration of behaviour supported by organisational norms, values and assumptions. Artefacts range from physical aspects such as architecture to forms of language, to rituals. Organisational members could be less aware of organisational culture, but it is observable to the outsider (Schein, 1985).

Artefacts include any materials, patterns that communicate information about an organisation's technology, beliefs, values, assumptions and practices (Ott, 1989; Schein, 1999). Artefacts are not easily understood, although visible within the

organisation. Artefacts inevitably provide an “image” of the organisation and its culture (Shultz, 1995; Schein, 1999).

Symbols are representations of the meanings that express more than their extrinsic content. Symbols represent wider patterns of meaning causing organisational members to associate consciously or unconsciously at different levels of meaning. Symbols could include anything ranging from a flag, building, neon sign to a picture of the chief executive officer or leader (Ott, 1989). Symbols have a variety of functions in the context of organisational culture. The function of symbols is to serve as a reflection of organisational culture. Secondly, to serve as triggers of internalised values of the organisation. Thirdly, to serve as a context for the experiences of organisational members and fourthly to facilitate the integration of the systems of meaning (Rafaeli & Worline, 2000).

Dress codes of organisational members can suggest the level of competence of the wearer. The dress codes and the expected behaviour of those members also indicate roles. Furthermore, dress indicates the role in the hierarchical level and functional area (Rafaeli, Dutton, Harquail, Makie-Lewis, 1997). Differences may however occur across organisational boundaries.

Names of organisations are linked to the identity of the organisation. As organisations change their names, so do their identities and the legitimacy of identities change. The names organisations adopt tend to reflect organisational practices (Glynn & Abzug, 2002).

Some artefacts have the means of providing information about the organisational technology, e.g. computers, telephone systems (Ott, 1989; Shultz, 1995).

The physical arrangements of an organisation provide other concrete evidence of the culture. Architecture, office design, decorations, dress codes and the attendance of functions are an indication of organisational culture and the attractiveness of the organisation (Rafaeli & Worline, 2000; Shultz, 1995).

Some of the artefacts are patterned behaviour including organisational language, jargon, stories, tales, myths, jokes and metaphors (Alvesson, 2002; Ott, 1989; Phillips, 1995; Shultz, 1995; Wilson, 2001). The value of artefacts lies in the expression of symbolic purpose, and help to transmit shared meanings and realities to organisational members within the organisation (Ott, 1989; Wilson, 2001).

Language is a part of organisational culture. Language must be learnt so that organisational members can communicate effectively. Language includes words, phrases and acronyms not comprehensible to outsiders. Language serves to identify members of a group and those who do speak the language (Ott, 1989; Shultz, 1995). Closely related to language is jargon. Jargon tends to focus meaning in a few words. Meaning attached to the word is different from the meaning attached in everyday language. Jargon is most often not comprehensible to non-organisational members (Ott, 1989). Jargon is so culture specific that non-organisational members would be able to identify text from organisational documentation (Payne, 2000).

Metaphors are powerful representations of organisational language because of the communication of meaning beyond the obvious context of words. Metaphors help to put meaning to experiences and resolve apparent contradictions and paradoxes (Alvesson, 2002; Ott, 1989). Myths are extended metaphors. The story, as part of the myth has a part that is factually correct and focuses on the origins of beliefs or values of the organisational culture. Myths develop from happenings in the past and serve to link the past to the present and future. Some myths may have inaccuracies, but are perpetuated as myths because it is functional within the organisation (Ott, 1989).

Stories relate to anecdotal events that have occurred in the past. While similar to myths, the content of stories tends to be accurate. Often, stories communicate morals metaphorically and can be related to the core values of the organisation. Stories communicate core message implicitly or metaphorically. Stories have a major influence on the attitudes members have. Messages are retained longer than messages transmitted by other means. Stories make good vehicles for the transmission of organisational culture when socialising new members (Ott, 1989; Wilson, 2001). Storytelling in some organisations is done in a sophisticated manner

by using elaborate advertising and creating a sense of community between the organisation and its stakeholders (Mills, Boylstein & Lorean, 2001).

Applicants for jobs obtain information about the culture of an organisation from word of mouth accounts of organisational members of what is important and how the organisation would like to be perceived. It is the stories of what is valued in the company that is perceived to be valuable which results in career decisions (Cable, Alman-Smith, Malvy & Edwards, 2000). Some organisations have story-telling as an integral part of the organisational processes. Stories indicate the values and characteristics of particular practices. Stories indicate the significance of contributions of significant people in the organisation. Furthermore, the stories tend to relate the norms that apply. Organisational and non-organisational members tell stories of what is acceptable and not acceptable. The content of stories range from privileges to discipline (Boje, 1995). Sagas and legends are the stories told that relate to the history of the organisation. Sagas and legends have the capability to illustrate the distinctiveness of the organisation. Legends provide information about alliances, commitment and emotional investment (Ott, 1989).

Organisational scripts are the outlines of stories. Scripts contain a setting, organisational context, plot with events and central characters with roles. Scripts are generalised to different contexts when required. Where a script is required, a story is created that communicates the morals indicating the values, beliefs and basic assumptions applicable to the incident (Ott, 1989). Heroes are the leading actors in organisational life. Heroes are the embodiment of the values of the organisation and provide a mechanism to relate the strengths of the organisation. Hero's behaviour set standards and acts as role models (Ott, 1989; Schein, 1999).

Ceremonies and commemorations are celebrations of the values and basic assumptions held by organisations. Ceremonies celebrate the achievement of heroes (Ott, 1989). Schultz (1995) refers to the traditions of organisations where certain behaviours are perpetuated within the organisation. Ceremonies are public manifestations of organisational culture. Ceremonies are extraordinary experiences and are remembered in vivid terms by members giving meaning to organisational events (Ott, 1989, Trice & Beyer, 1984). Rites and ceremonies are characterised by

elaborate planned activities, involve social interaction, usually benefit an audience and have social consequences for organisational members involved (Trice & Beyer, 1984).

All organisations have routine activities performed in the organisation. Patterns of behaviour include those activities that organisational members do automatically. Patterns include rites, rituals, and behavioural norms (Ott, 1989). Cultural norms are demonstrated in patterns of the way things are done. Organisational competitiveness is inherent in the norms and practices. Such practices are related to entrepreneurship, innovation, learning and provide the organisation with the basis of competitiveness (Hult, Ketchen & Nichols, 2002).

Rites and rituals are habits that have developed in the organisation. Typically, rites and rituals are mundane, stylised and programmed activities. Many rites and rituals tend to provide security and establish meaning and identity in the organisation. Rites and rituals as described above provide vehicles for control (Ott, 1989; Wilson, 2001).

2.5.3.2. Beliefs and values

Level two of Schein's (1985) model, relates to values and norms. Values represent the principles and standards valued by organisational members. Values are the foundation as to what is acceptable and what is not acceptable. That which is considered right and wrong forms a system or an ethical code. Values operate at a different level than that assumptions, though not obvious, values operate uppermost in members' minds. Organisational members are able to recognise their values especially when challenged by others (Schein, 1985).

Norms are related to values. Norms provide the unwritten rules that indicate the expectations in terms of actions applicable in a number of situations. Norms within the business environment could include appropriate communication approaches in different situations or what could be said to the Chief Executive Officer (Schein, 1985).

Values indicate what is important to organisational members. Norms help to indicate what the expectations are among organisational members. The relationship between

norms and values is that which is considered acceptable and can be traced to what is valued in a particular culture. Therefore, organisational members share values and conform to norms because the foundational assumptions support the norms and values. Norms and values support the manifestation of more obvious observable behaviours (Ott, 1989).

Beliefs and values are at another level on the continuum of organisational culture. In the context of organisational culture, they represent beliefs, values, ethical codes, moral codes and ideologies. Shared beliefs and values are functional for the organisational members in that choices and decisions are based on the values held. Beliefs are consciously held (Ott, 1989; Schein 1999).

Values are affective desires or wants and are important to people and can be associated with almost anything. Beliefs are what people believe to be true or real. Beliefs are also what is important to people. The importance of beliefs and values can be related to the influence on the patterns of behaviour and the resultant artefacts (Ott, 1989; Schein, 1999). Organisational values relate to many organisational outcomes. Outcomes include job satisfaction and organisational commitment (Kirkman & Shapiro, 2001), organisational performance (Denison, 1992; Kotter & Heskett, 1992), competence (Zwell, 2000) and strategy (Kaplan & Norton, 2001).

Beliefs provide cognitive foundations for organisational behaviour while values provide the emotional energy required to demonstrate the behaviour (Ott, 1989). The influence of beliefs and values range from the products and services provided by the organisation to people management practices. Values determine what is good, and how business is conducted, Values also provide information of the role of the organisation in society and what the organisation believes in. Values furthermore, provide the context to what is communicated to the outside world in terms of marketing (Wilson, 2001).

Espoused values and values in use, could represent practical applications of values, or a theoretical view of values. Beliefs and values are what people admit to and are

able to articulate. Basic values are what people actually believe in and feel which informs their actual behaviour (Ott, 1989; Schein, 1999).

In the context of beliefs and values are moral codes and ideologies. Ethical and moral codes are those systems, which relate to beliefs, values and moral judgements (Ott, 1989). Ideologies on the other hand develop out of dominant systems of thoughts, beliefs and values. Ideologies enable the organisational members to integrate different organisational beliefs and values. In practice, a distinction is made between ideologies and moral or ethical codes (Ott, 1989).

Norms are the prescriptions for behaviour and serve as blueprints for organisational members in general. Norms are useful for those organisational members who do specific functions and have particular roles in the organisation. Norms have the effect of providing structure and coherence. Norms stabilise organisational behaviour and provide a framework for common expectations and attitudes (Ott, 1989; Wilson, 2001).

2.5.3.3. Basic underlying assumptions

Level three of Schein's (1985) model of culture relates to underlying assumptions. Assumptions are the basis of an organisation's culture. Where solutions to a problem work continuously, the solution is used unconsciously and becomes the way things are done by the group. The underlying assumptions are the foundation of an organisation's culture. Assumptions are the basis for the manner in which organisational members think and feel. Assumptions are unconscious and are taken for granted. The assumptions are complex and a variety of assumptions are applied in a culture at a time (Schein, 1985).

Organisational assumptions are conceptually at the higher level of the organisational culture continuum. Basic assumptions are those acts and behaviours that have proved to be useful so often, that the behaviour is no longer conscious behaviour (Ott, 1989: Schein 1985; 1999).

Assumptions are demonstrated behaviour seen to be organisational scripts. Organisational scripts are those dramatic patterns which occur in the organisation and are represented generation after generation (Ott, 1989).

2.5.3.4 Time

Time is an important aspect not included in previous levels of culture as conceptualised by Schein (1985). Time is important when considering organisational culture. Time is related to the values and beliefs that organisational members hold in terms of the activities that need to be done. Time relates to the complexities of the tasks that organisational members need to complete. Tasks may be completed in a linear manner (monochronic time) or simultaneously (polychronic time) and would depend on the abilities of organisational members or the requirements of the task. Organisational culture practices would require ether polychronic or monochronic time approaches in the work environment (Bluedorn, 2000).

The domains of organisational culture range from those aspects that are highly visible to those components which require sophisticated procedures to identify the elements. While the elements have been described in the above format, the aim has been to highlight the nature of the domains. The domains do not operate in isolation and would interact with each other in the different contexts of organisations.

The above examples of levels, domains and associated elements have been provided to illustrate how models are useful in the area of organisational culture research. Martin (2002) and Ashkanasy et al. (2000) provided a broad framework for the choice of model when developing organisational culture instruments.

Conceptually culture has common characteristics irrespective of the context wherein culture is described. Culture, in the broad anthropological field shares similar domains at national and in organisational fields. The differences are evident only in the manner in which the domains manifest at the different levels.

The integrated organisational culture model (Figure 2.4.) aims to integrate the features of culture at the levels of artefacts, beliefs and values and underlying basic

assumptions. Behaviour is observed as a result of the manifestation of culture of the respective levels. The behaviour allows for a distinctive profile of the organisation. The relationships of the organisation culture features are related to organisational outcomes.

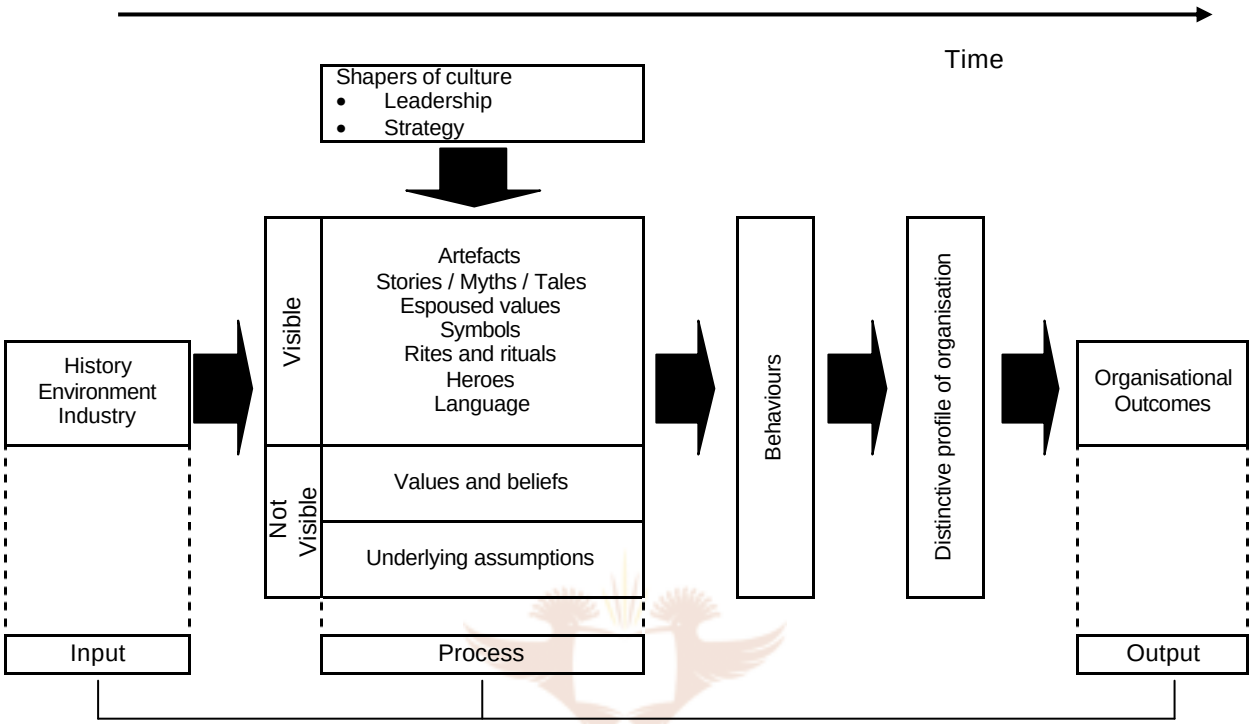

Figure 2.4: Integrated model of organisational culture

(Adapted from Ashkanasy et al. 2000; Beals & Hoijer, 1979; Bluedorn 2000; Christensen & Gordon, 1999; Denison, 1990; Flamholtz, 2001; Flamholtz & Aksehirli, 2000; Hofstede, 2001; Kaplan & Norton, 2001; Kotter & Heskett, 1992; Martin, 2002; Ott, 1989; Payne, 2000; Phillips, 1995; Rowlinson & Procter, 1999; Schein, 1985; Trice & Beyer, 1984; Wilson, 2001; Zwell, 2000).

In the next section, measurement and scales aspects necessary in the design of organisational culture instruments are discussed .

2.6. Measurement and scaling

Measurement is the assigning of numbers to individuals, objects or constructs in a systematic way as a means of representing properties of the individuals. Numbers

are assigned to the individuals, objects or constructs in a carefully prescribed, repeatable procedure (Allen & Yen, 1979).

Nunnally and Bernstein (1994) were more specific in their ideas on measurement as required in organisational culture instrumentation. They define measurement as follows: " *measurement consists of rules for assigning symbols so as to (1) represent qualities of the attributes numerically (scaling) or (2) define whether the objects fall in the same different categories with respect to a given attribute (classification)."* (pp. 3-4).

Most of what has been called measurement in the organisational research involves scaling. The way scales work is not that obvious on their own. For that reason, some rules are required. Rules are important in the arena of standardisation (Nunnally & Bernstein, 1994). A measure is standardised when the rules are clear, are practical to apply, do not demand exceptional skills from users and the results do not depend on the results of a particular user (Cronbach, 1990; Nunnally & Bernstein, 1994).

The features that distinguish the levels of measurement are indicated Table 2.1. The higher levels of measurement accommodates characteristics of lower levels of measurement.

2.6.1. Nature of the levels of measurement

The relevance of levels of measurement relates to the analytical procedures used (Allen & Yen, 1979; Babbie & Mouton, 2001). The main features of the different levels of measurement are provided in Table 2.1.

In the design of scales, the issues of having equal intervals and absolute zero points remain problematic. The important issue is that where the attribute fails to comply with the basic operations of the attribute, there are limited mathematical operations available to the practitioner. Furthermore, some practitioners often use scales that produce results that are weaker than ordinal scales that could be used. The

practitioner needs to consider the assumptions made about the attribute measured and the choice of level of measurement, and then the construction of the scale used (Nunnally & Bernstein, 1994).

Table 2.1 Levels of measurement

Classification of scale	Level of measurement	Basic operation	Description	Determining measurement level	Permissible statistics	Response scale application
Categorical scales	**Nominal level measurement**	Equality versus inequality Classification / distinctness	Use of numerals to identify objects, individuals, events or groups.	Unique numbers are assigned to objects or events. Numbers may be changes as long as the numbers assigned to objects are different	- Frequencies, mode	Respondents categorise or sort objects or events into mutually exclusive and exhaustive sets. Sets of data are mutually exclusive for each object and are sorted into one set only.
	Ordinal level measurement	Greater than versus less than Ordering of objects	In addition to identification of, numerals describe relative characteristics posed by the event, individual.	Larger numbers are assigned with more that one property measured. When scale value is assigned, the scale may be changed as long as the ordering of the scales maintained.	**Including statistics from the previous level.** - Median, percentiles, order statistics, correlation.	Respondents rank-order object or events in terms of some property. Objects or events are ranked higher or lower by assigned values according to the property. Rating scales usually involve people by asking to indicate opinions, beliefs, feelings or attitudes.
Continuos scales	**Interval level measurement**	Determination of equality of interval or differences. Equal intervals	Includes the properties of nominal and ordinal scales. Including intervals between consecutive points that are equal.	Interval level have numbers that allow calculation and interpretation of ratio interval / intervals between scales	**Including statistics from the previous level.** - Arithmetic mean, variance, Pearson correlation.	Respondents to assign numbers to stimuli or differences to stimuli through direct estimation, produces interval scales. The scale values produced often take the mean or median of the values obtained from many respondents. Direct estimation methods assume respondents are skilled enough to make interval judgements.
	Ratio level measurement	Determination of equality of ratios. Absolute zero	Includes the properties of nominal, ordinal and interval scales. Has an absolute zero point.	Ratio level scales have numbers that allow calculation and interpretation of ratios of scale values	**Including statistics from the previous level.** - Geometric mean.	*Ratio scales are produced using the method of direct estimation. Respondents are required to assign numbers to stimuli or ratio stimuli.*

(Adapted from: Allen & Yen, 1979; Babbie & Mouton, 2001; Gregory, 1996; McDaniel & Gates, 2001; Nunnally & Bernstein, 1994; Welman & Kruger, 2001).

2.6.2. Response scales

Many response scales are available to the practitioner, though there are only a few that are not complex, expensive, and labour intensive to develop. Some formats have been more popular than others have while others have been highly regarded, though not often used like the Thurstone and Guttman scales (Rubin & Babbie, 1997). The Likert scale and Semantic differential scale have been the more popular of the scales.

2.6.2.1. Semantic differential

The semantic differential scale requires respondents to choose between two opposite positions. When developing the scale, dimensions need to be developed using opposite terms. Respondents then choose from the selection of dimensions. The dimensions could be identified as hot and cold, or simple and complex. A scale could be constructed that looks as follows. The respondent would respond by marking a response in a block. The pacing of dimensions are varied to creating a random pattern (Rubin & Babbie, 1997). Below is an example of the response format.

	Very much	Some what	None	Somewhat	Very much	
Fun	☐	☐	☐	☐	☐	Boring
Ugly	☐	☐	☐	☐	☐	Beautiful

Figure 2.5: Semantic differential scale
(Adapted from Rubin & Babbie, 1997)

2.6.2.2. Likert scaling

The Likert scale is one of the more popular formats used in surveys and questionnaires. The more common format is to have a respondent, respond to a statement and then to give a choice of responding to positions on a scale of either strongly disagree or disagree or undecided or agree or strongly agree. An example of a more popular response format is set out below.

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

Figure 2.6: Likert scale

(Adapted from Church & Waclawski, 1998; Fink, 1995)

Likert scales offer ordinal response categories where respondents are able to provide responses indicating the intensity of their responses (Swart, Roodt & Schepers, 1999). The format allows for uniform scoring. The assumption made using the Likert scale is that the summated score of responses for a particular variable provides a good indicator of that variable. Best items are identified using item analysis to identify items that will provide the best results for the variable. Furthermore, an assumption is made that all items have similar intensity as the rest of the items (Rubin & Babbie, 1997).

As indicated above, the scale points on the Likert response scale are labelled. Newstead and Arnold (1989) have found that when comparing labelled and unlabelled Likert response scales, higher means were obtained on the unlabelled scales. Others (Huck & Jacko, 1974; Dixon, Bobo & Stevick, 1984) have obtained conflicting results. Chang (1997) has compared the effects of labelled and unlabelled Likert type scales. He concluded that the results obtained from Likert response scales may be generalised across different anchoring labels. He emphasis that the numerical values need to be defined and used consistently across the labels.

In survey research, a single response format is used in surveys, most often where only one component of the issue is then measured. In some measures, there is at times the need to measure the discrepancy between the actual status (for example actual competence) of an attribute or issue and a future (for example desired competence) status of an attribute or issue. The two-response scale format satisfies this need. Using the two formats has the potential to identify the range of discrepancy on issues where further action would be required. The discrepancy format provides stronger discrimination for measurement. Evidence suggests that five-point response scales are most reliable where attitudes are measured as found in the more

commonly used one-column format. Furthermore, the Likert scale has been found to have the best predictive validity (Johnson & Dixon, 1984).

2.6.2.3. Intensity scales

Intensity scales are similar to Likert scales, though the anchoring of the scale is limited to the extreme poles of the scale. The interval qualities of the scale become redundant as soon as more that two of the interval points are anchored (Schepers, 1992: Torgerson, 1958). The intensity scale thus provides for the advantages of the interval level of measurement and continuous scales. Below is an example of a response format.

Strongly agree	1	2	3	4	5	6	7	Strongly disagree

Figure 2.7: Intensity scale
(Adapted from Schepers, 1992)

The seven-point response scale lends itself to factor analytic techniques (Schepers, 1992). Factor analysis is typically used in instrument design to determine the construct validly (van der Post, de Coning & Smit, 1997) and factorial validity (DeVellis, 1990). The seven-point scale would also contribute to extending the variance of the scale thereby enhancing the reliability of the scale (Swart et al, 1997).

2.6.2.4. Visual analog scale

The response format is a continuous line between two anchors representing opposites on a continuum. The respondent is instructed to place a cross on the line at that point that would represent the opinion, belief, experience or what ever is being measured. As with the intensity scale, the analog scale is a continuous scale. The practitioner determines the calibration of the line. Unlike other response formats, the format accommodates the construction of a scale that is very sensitive making the scale useful for the measuring of phenomena in a before and after the event type

situation. The situation could be an intervention or an experimental situation (DeVellis, 1990).

The disadvantage of the scale is the interpretation of physical space between the anchored labels, by respondents. A mark on the line would mean different things to different people, even with the opposite ends of the line anchored. The advantage of the scale is that when the instrument is repeatedly administered, it would be near impossible for respondents to remember where they has placed their marks on previous occasions (DeVellis, 1990). Below is an example of a response format.

No feedback is given at all. _____ Feedback is given constantly.

Figure 2.7: An analog scale

(Adapted from DeVellis, 1990)

2.6.3. Levels of measurement and measurement and scales

In practice, most measurement instruments are assumed to use interval-level measurements. The absolute equality of intervals of such instruments is difficult to prove (Gregory, 1996). The controversy on the usefulness of some measures has yet to be resolved (Nunnally & Bernstein, 1994).

2.6.4. Challenges in the use of rating scales

Each of the levels of measurement offer opportunities for deriving different types of data and grouping of item in a particular way (Allen & Yen, 1979; Church & Waclawski, 1998; Gregory, 1996).

Response scales cannot be divorced from those who respond to the scales. The validity and reliability is affected by responses on rating scales by the response styles of the respondents (Jackson & Messick, 1967; Nunnally & Bernstein, 1994). Seckrest and Jackson (1967) described the results of different response outcomes in terms of categories. The categories are useful in the interpretation of the results obtained from

measurements. The categories are absolute or relative deviation; statistical infrequency, extreme characteristics as deviation; unique structuring of constructs as deviation and random as well as specific responding as deviation. From the results of research, practitioners will gain information that could add quality to the interpretation of the results obtained.

The essential condition for response styles is that no rational explanation can be found for the choices of respondents. The choices made could be ascribed to realistic responses, ambiguity, meaninglessness or difficulty of items. Under these conditions the respondent will respond according to a particular response style (Brown, 1983). The controversy regarding response sets combined with other diffuse factors has yet to be resolved. The responses on self-report instruments are a combination of self-deception, impression management and realistic self-portrayal (Anatasi & Urbani, 1997). The practitioner needs to take cognisance of the response bias discussed below.

2.6.4.1. Halo effect

Halo effect occurs where respondents are unduly influenced by favourable or unfavourable attributes that influence their judgement on the attribute being measured (Anastasi & Urbani, 1997).

2.6.4.2. Leniency or stringency bias

Leniency or stringency error refers to where the respondent tends to rate all individual or attributes either too strictly or too leniently (Guilford, 1954; Welman & Kruger, 2001). Responses tend to be on the extreme of scales. Respondents respond often without considering the contents of the questions asked. Where blacks and whites participated in the same study, when compared to whites, blacks tend focus their responses at the ends of the response scale (Bachman & O'Malley, 1984). Greenleaf (1992) reported conflicting findings in research on extreme response style. He indicated that there is evidence that the response style in not stable and that response styles are not necessarily related to personality or

demographic variables. He did report that income, education and age were positively related with increased extreme response style.

2.6.4.3. Logical error

Logical error is similar to the halo effect (Guilford, 1954). Logical error is the tendency to rate attributes similarly that are considered logically related (Guilford, 1954: Welman & Kruger, 2001).

2.6.4.4. Central tendency bias

Central tendency bias occurs where respondents who are reluctant to rate attributes at the extremes of the scale, tend to place most attributes at the centre of the scale (Guilford, 1954; Welman & Kruger, 2001). The challenge of dealing with central tendency or *"don't know"* responses continues to be a problem for practitioners and the associated interpretations of the response (Fleick, 1989; Poe, Seeman, Mclaughlin, Mehl & Dietz, 1988; Duncan & Stenbeck, 1988). The origins of central tendency responses are multiple and could be ascribed to an error response in the sense that the respondent may have misunderstood the item. Secondly the respondent is ambivalent or ignorant to the alternatives available (Fleick, 1989; Sanchez & Morchio, 1992) and finally, the responses could be a "*non-attitude*" (Fleick, 1989; Gilljam & Granberg, 1993). Where the response options include "*no opinion*" or "*not sure*" these responses should not be interpreted as being interchangeable (Duncan & Stenbeck, 1988).

2.6.4.5. Constant error

Constant error occurs where respondents tend to exaggerate the difference between themselves on an attribute or those being rated (Guilford, 1954; Welman & Kruger, 2001). Guilford (1954) reported that the phenomenon may be ascribed to respondents requiring others to be similar and are surprised when the opposite is true, thus exaggerating their own responses in an instrument.

2.6.4.6. Proximity error

Proximity error introduces high covariances among construct measures. The error is attributed to the nearness in space and time of items in an instrument. Similar items spaced close to each other tend to inter-correlate higher than items spaced remotely (Guilford, 1954).

2.6.4.7. Statements and acquiescence bias

In the construction of personality, interest, attitude and value instruments, two item, formats are used. The first is in the form of questions, while the other in the form of statements to which the respondent should agree or not agree (Schepers, 1992).

In personality and interest instruments, use is made of questions. Use is made of intensity scales, which are often designed, as ordinal measures. At times use is made of the Likert scale in instrumentation, which is also an ordinal response scale (Schepers, 1992).

Where statements are used in the item format and the Likert response scale is used, respondents are likely to respond in the affirmative without having considered the content of the item (Petty, Rennier, Cacioppa, 1987; Schepers, 1992). This response style is referred to an acquiescence response style (Anatasi, 1968; Jackson & Messick, 1967). To deal with the problem, questions require the respondent to engage in the items to avoid the acquiescent response (Schepers, 1992). Questions require more thoughtful responses (Petty et al., 1987). Good practice requires that questions be posed in instruments.

2.6.4.8. Prestige bias

The meaning of an item associated with an item depends on the meaning related to the wording. Questions set in a way that encourage a particular response are biased. Some respondents tend to respond in way that is socially desirable. The response will depend on the manner in which questions are worded (Rubin & Babbie, 1997).

The use of prestige names in questions is also likely to introduce bias into responses. The effect is to confuse attitude with evaluation of the issue at hand of the person or symbol. Furthermore, prestige names add to the stimuli presented, thus contributing to the variance. The interpretation of the responses becomes difficult as respondents may or may not be responding to the names symbols or issue referred to (Smith & Squire, 1990).

2.6.4.9. Controlling response bias

Brown (1983) offers some advice to control bias. He suggests obtaining the co-operation of the respondents by explaining the purpose of the instrument. The instrument should also have clear instructions and be well structured to eliminate ambiguity.

The response biases and response styles that confound the results of instrumentation have been discussed above. The response bias and style influence the metrics obtained on instrumentation. Next, the metric properties important in instrument design are discussed.

2.7. Metrics of instruments

Reliability and validity of instrumentation is always a concern of practitioners. Practitioners are concerned that the recommendations made are done, based on sound measures that would benefit the implementation of interventions. Below, reliability is discussed first.

2.7.1. Reliability

Synonyms for reliability include dependability, stability, consistency, reproducibility, predictability and lack of distortion (Kerlinger & Lee, 2001, p. 642).

Reliability and the validity of measuring instruments are always of concern to users of measuring instruments. While validity sometimes appears obvious for some measures, reliability tends to be more elusive (Magnusson, 1967).

Some of the characteristics of reliability are:

- Reliability is concerned with the accuracy of instrument used repeatedly under identical conditions (Magnusson, 1967).
- *"Reliability is a lack of distortion or precision of a measuring instrument"* (Kerlinger & Lee, 2001, p.642).
- The reliability of a measure could be influenced by variety sources of error (Nunnally & Bernstein, 1994; Magnusson, 1967).

The descriptions indicate the challenges related to the interpretation of reliability scores obtained.

2.7.1.1. Measures of reliability

Reliability refers to the constancy of scores obtained from respondents using the same instrument on successive occasions or sets of comparable items or changed assessment conditions. Reliability is the foundation of the calculation of the error of measurement of a single score, where predications can be made of the fluctuation in a single respondent's score as a result of irrelevant or chance factors (Anastasi & Urbani, 1997 p.54).

Reliability indicates the extent to which individual differences in scores may be ascribed to true differences in the characteristics or constructs considered and extend to which differences could be ascribed to chance factors. From a technical perspective "*measures of test reliability make it possible to estimate what proportion of the total variance of test scores is error variance*" (Anastasi & Urbani, 1997, p. 84).

Four methods are used in the estimation of reliability. The methods range from the test-retest method to internal consistency measures. In instrument design, the context of use of the survey determines which method is the most appropriate. Since

organisational culture instruments are used infrequently, the focus is on the internal consistency measures.

2.7.1.2. Test–retest method

The test-retest method is used when an instrument is administered two or more times to the same group of respondents. The interrelations of the scores on the different administration of the scores on the different applications of the instrument indicate the reliability of the instrument (Anastasi & Urbani, 1997; Gheselli, Campbell & Zedeck, 1981). The error variance would correspond to the fluctuations of performance of respondents from one session to the following. Variations could be ascribed to changes in the testing conditions. Part of the change is related to respondents themselves. Retest reliability indicates the extent to which scores could be generalised to different situations after repeated administrations. Where high scores of reliability are recorded, the scores are likely to change due to conditions in the respondents or the test conditions (Anastasi & Urbani, 1997).

2.7.1.3. Parallel form of reliability

Parallel forms of reliability are obtained from a series of two or more forms of a test. The instruments are characterised by similar content, though the instruments do not have exactly the same specific components. The correlation between the scores obtained is the reliability of the instrument (Anastasi & Urbani, 1997; Gheselli et al., 1981).

2.7.1.4. Split-half test reliability

Often candidates cannot be measured again and there is only one opportunity to administer the instrument. The estimate of reliability is observed by splitting the instrument into two parallel forms. The results of the procedure would be a test of two or more shorter versions of the original instrument (Anastasi & Urbani, 1997; Gheselli et al., 1981). The split-half reliability provides a measure of the consistency sampling

of the content. The literature refers to this form of reliability as the coefficient of internal consistency (Anastasi & Urbani, 1997).

Spearman-Brown formula is applied to the inter-correlations among the parts of the test and estimates the reliability for the whole test. The following formula is applicable:

$$r_{ii} = \frac{2r_{½½}}{1 + r_{½½}} \quad \text{.....(1)}$$

Where:

r_{ii} = is the reliability of the whole test and

$r_{½½}$ = the reliability coefficient of half of the test.

The challenge of the split-half method is to divide the test into comparable parts. One approach is to divide the instrument items into two. A second approach is to assign the items numbers into odd and even numbers. The approach is appropriate where there are multiple items in an instrument and is the most common approach. The second approach facilitates the control of systematic errors by assigning items randomly (Gheselli et al., 1981).

2.7.1.5. Internal consistency among test items

Internal consistency describes the estimates of reliability based on the average correlations among the items within an instrument (Nunnally & Bernstein, 1994, p.251). Taking the Spearman-Brown formula as point of departure, it is possible to enter the correlation between any two components (McIntire & Miller, 2000). The resultant formula would be:

$$r_{xx} = \frac{nr}{1 + (n-1)\, r} \quad \text{.....(2)}$$

Where

r_{xx} = the estimated reliability of an instrument

n = the numbers of items in the revised version divided by the number of questions in the original version of the instrument.

r = the calculated correlation coefficient.

where the elements of the instrument are dichotomous which is often the case.
To determine the questionnaire flow and format, the Kuder-Richardson 20 is appropriate.

$$r_{KR\,20} = \frac{\ldots k \ldots \quad ?_{pq}}{k-1 \quad (1 - s^2_x)}$$

……(3)

Where:

r_{KR20} = the Kuder-Richardson formula reliability coefficient.

pq = refers to the variances of the items.

k = the number of items in the instrument.

s_{x^2} = to the variance of the total scores.

The Kuder-Richardson formula 20 is useful for discrete or dichotomous scores (Gheselli et al., 1981; McIntire & Miller, 2000). For continuous scores the Cronbach Alpha formula is the appropriate formula (Cortina, 1993; Gheselli et al., 1981; McIntire & Miller, 2000).

$$r_x = \frac{\ldots k \ldots}{k-1} \left(\frac{V_x - ?V_1}{V_x} \right)$$

$$= \frac{\ldots k \ldots}{k-1} \left(\frac{?? \; C \; V_{11}}{V_x} \right)$$

……..(4)

Where:

?? C V_{11} = the sum of the interpart scores and

V_x = variance of the total score in more familiar form

K = the number of items in the instrument

r_X = Cronbach's Alpha

$$r_x = \frac{..K..}{K\text{-}1} \left(\frac{..? \; V_{11..}}{1 - V_x} \right)$$

……(5)

The denominator is the variance of the total score, $?V_1$ is the sum of the part variance and K equals the sum of the parts (Gheselli et al., 1981).

The extent of Cronbach Alpha is the function of the ratio of the sum of the interitem or interpart variances, covariance to the total score of the total score. The sum of the covariances is a function of the inter-correlations among the parts (Gheselli et al., 1981).

Characteristics of Cronbach Alpha are:

- the mean of all split-half reliabilities (Cortina, 1993).
- the lower bound of reliability of an instrument (Cortina, 1993 p.99). Nunnally and Bernstein (1994, p. 252) disagreed and reported that Cronbach Alpha sets the upper limit of reliability of an instrument.
- an indication of first-factor saturation (Cortina, 1993).
- equal to the reliability conditions of essential tau-equivalence (Cortina, 1993.
- a more general version of the Kuder-Richardson, a coefficient of equivalence (Cortina, 1993).

Of the reliability measures available, Cronbach Alpha is the most robust measure of reliability (DeVellis, 1990: Van der Post et al., 1997).

2.7.2. Validity

Anatasi (1986) asserted that the concept validity has been the subject of confusion. Different labels have been developed and a tripartite classification evolved. These are content, predictive, and construct validity. While it is useful to have a classification of the concepts, any information used in the development of an instrument is relevant to the validity of the instrument. Validation of instruments is not an event, but a process.

The most common definition refers to "*the extent to which a test or set of operations measures what it is supposed to measure*" (Gheselli et al., 1981, p.266).

2.7.2.1 Criterion-related validity

Criterion related validity is established where the instrument scores can be related to the criterion. The criterions are identified behaviours used to predict future behaviour (Allen & Yen, 1979). Two types are identified; predictive validity and concurrent validity.

2.7.2.1.1. Predictive validity

At times, an instrument is used to predict some future action or behaviour. The task is to investigate to what extent an instrument corresponds to, or is related to another variable that is required in the future. The method refers to criterion-related validity. Where a relationship exists between the predictor scores and the criterion score, these are called validity coefficients (Gheselli et al., 1981; Nunnally & Bernstein, 1994).

Typically, the procedure included obtaining an adequate sample, measuring them on the predictor. Time is allowed to pass before obtaining criterion scores on the same sample. The correlation is then calculated between the predictor score and the criterion-score (Gheselli et al., 1981).

2.7.2.1.2. Concurrent validity

Often the need is to establish the extent to which an individual currently possesses a particular construct or behaviour in a particular manner. Scores are used on one variable to estimate scores on the other variable. Both scores are indicators of current performance. The information obtainedis the concurrent validity (Gheselli et al., 1981; Nunnally & Bernstein, 1994).

2.7.2.2 Convergent validity

When an instrument is developed, the constructs in the instrument are expected to correlate strongly with scores for these individual constructs as measured on other

tests. As soon as the correlation is high, convergent validity is achieved (Allen & Yen, 1979; McIntire & Miller, 2000).

2.7.2.3. Content validity

Content validly refers to the extent which characteristics are measured in a particular instrument as judged by the appropriateness of the content of the instrument. The question typically asked is "*Does the instrument measure what it is supposed to measure based on the content?*" (Gheselli et al., 1981).

Ensuring item homogeneity may enhance content validity. Another process is to have a panel of subject matter experts rate the content of an instrument independently. Each of the panels would study the definition of the area of interest. Content for a similar instrument starts with a definition of the area of interest. Content of the instrument would be compared to the content of the items developed by the subject matter experts (Gheselli et al., 1981; Nunnally & Bernstein, 1994).

Content validity relies on the subjective judgements of the assessor, therefore is subject to greater error than other means of establishing validity (Allen & Yen, 1979).

2.7.2.5. Discriminant validity

When instruments are developed to measure different constructs, discriminant validity is displayed by low correlations between scores on instruments assessing different constructs. Low correlations indicate that the instruments discriminate between the respective constructs (Allen & Yen, 1979; McIntire & Miller, 2000).

2.7.2.6. Factorial validity

Factorial validity is a version of construct validity and is established through factor analysis (Allen & Yen, 1979). Factor analysis is a multivariate statistical method

where the main purpose is to identify the underlying structure of the data. The method produces a set of underlying dimensions called factors. Factor analysis identifies the separate dimensions of the structure of the data and then establishes the extent to which each variable is explained by each dimension. Validity is established by the extent to which a set of measures accurately represents the construct under investigation (Hair, Anderson, Tatham & Black, 1998).

2.7.2.7. Face validity

Unlike the other procedures to assess validity, face validity does not indicate in exact terms what an instrument actually measures. Instead, face validity relies on what it is perceived to measure by those completing the instrument. It is the face validity of an instrument that contributes to respondents making a concerted effort in the completion of the instrument (McIntire & Miller, 2000).

2.7.2.8. Construct validity

Construct validity is the degree to which an instrument measures the theoretical construct the instrument is designed to measure (Allen & Yen, 1979). The process of establishing construct validity for an instrument measuring a construct includes the collection of evidence that the scores are related to observable behaviours in ways predicted by the underlying theory (McIntire & Miller, 2000).

In this section, measurement was discussed including different response scales and measurements that have to be considered in organisational culture instrument design.

At this point, the nature of organisational culture and its elements have been discussed. The theoretical foundation of organisational instrumentation relies on theory to create parameters for instrumentation measurement and design. The important aspects of measurement, scaling, response bias and popular response scales have been discussed providing background for the development of

organisational culture instrumentation. Aspects of organisational instrumentation design are discussed next.

2.8. Design considerations in organisational culture instrumentation

Broad aspects of instrument design will be outlined next.

2.8.1. A framework for instrument design

Well-designed organisational surveys are characterised by specific objectives to be achieved, specific outcomes, clear questions, sound research design, clear choice of sample, valid and reliable instrument(s), appropriate analysis, accurate reporting of results, and available resources that are related to specific needs (Fink, 1995a).

Schepers (1992) suggested the following criteria for standardised instrumentation design. The criteria are: appropriate content, content validity, good language, response scale format, variance of items, correlations among items, reliability, validity, instructions for use and scoring of instruments. Where an instrument is to be used, standard scores and norms should be available for the instrument.

The development of instrumentation is a purposeful, logical process. Various models are available for psychometric tests (Gregory, 1996; McIntire & Miller, 2000; Murphy & Davidshofer, 1998). Swart, Roodt & Schepers (1999) and Rust and Golombok (1999) offered specific suggestions for a designing instruments that would be useful in organisational culture instrument development. Feigl (1970) suggested a framework that is useful in instrumentation design, in that it provides a logic for developing items. Table 2.2 provides a framework for the design of organisational culture instruments.

TABLE 2.2

DESIGN PROCESS STEPS

Feigl 1970, p.9	Swart et al .,1999 p.34	**Rust & Golombok, 1999 pp.196-217.**	Organisational culture instrumentation development **summary**
Postulates	Define theoretical foundations of construct.	Define the purpose of the instrument.	Identify the construct - culture.
Primitive concepts	Identify the domains within the construct.	Develop blue print /specifications for instrument.	Define organisational culture model.
Defined concepts	Identify the sub-domains	Identify and define content areas.	Identify the sub-domains of culture.
Empirical concepts	Identify / develop behavioural indicators.	Identify how the construct would be manifested (that is the behavioural, affective areas).	Operationalise the sub-domains in behavioural terms
Observations / experiences	Develop item format taking care of the technical requirements of instruments and metrics.	Develop the items.	Develop the item format taking care of technical details as indicated by Schepers, 1992, pp.2-7.

2.8.2. Question formats

Different question formats used in organisational culture instruments include closed-ended questions and different response-scale formats (Church & Waclawski, 1998, McDaniel & Gates, 2001).

2.8.3. Closed-ended questions

Closed-ended questions require a response on pre-determined set of options. Providing alternatives from which the respondent can choose helps to manage the problems associated with open-ended question formats. Closed-ended questions allow for uniformity that allows for the processing of information (McDaniel & Gates, 2001; Rubin & Babbie, 1997; Satantakos, 1998). Closed questions fail to allow respondents to go beyond the answer format. The closed questions allow for

statistical analysis and relatively fast interpretation. Large groups of respondents can therefore be included in a survey (Fink, 1995a; Rubin & Babbie, 1997).

Closed types of questions are often separated into two-item response or dichotomous questions, multiple response options and scaled response questions. The choice of question depends on the nature of data required in the survey (McDaniel & Gates, 2001).

The difficulties in the use of closed-question format lie in the manner in which questions are structured. Where questions are clear there should be no problems. Secondly, questions should be mutually exclusive; respondent should not feel the need to choose more than one of the possible answers (Rubin & Babbie, 1997).

Questions must be designed to obtain accurate and consistent information. Well-designed questions are purposeful, complete and use correct grammar and have questions that are mutually exclusive (Fink, 1995b).

2.8.4. Guidelines for questions in item development

The following guidelines are useful when developing questions for instruments.

2.8.4.1. Purposeful questions

Purposeful questions establish the relationship between the intention of the questions and the objectives of the survey. Depending on the target population the connection may need to be made explicit (Fink, 1995a). Questions must support the purpose set beforehand to avoid redundancy (McDaniel & Gates, 2001). Questions should ask what is being measured (Sarantakos, 1998).

2.8.4.2. Unambiguous questions

Questions must be precise and unambiguous. Adding definitions of words and the dimension of time can facilitate making questions clear (Fink, 1995b); McDaniel & Gates, 2001). Instruments should be set in a manner that the respondent knows

exactly what is required (Fowler, 1992; Rubin & Babbie, 1997). Non-specific and hypothetical questions should be avoided (Sarantakos, 1998). Small changes in question wording can potentially affect the distribution of responses (Fowler, 1992). Gaskell, O'Muircheartaigh, and Wright (1994) found that where vaguely defined items were used in instruments, response shifts were detected in the data. The response alternatives facilitate the making of choices by respondents. The response choices help the respondents to interpret the question and to make their choices. In vaguely developed questions, the response alternatives are not neutral and must be carefully developed because they read as part of the question.

2.8.4.3. Complete questions

Questions that express a complete idea or thoughts should be used (Fink, 1995b). Questions should have complete sentences that express complete ideas. Incomplete sentences tend to make questions ambiguous (Fink, 1995a).

2.8.4.4. Avoid double-barrelled questions

When developing the questions, the aim is to keep the questions simple. Where questions have two parts linked with the word "*and*", the possibility of a double-barrelled question exists. Double-barrelled questions introduce ambiguity into questions. Having two parts to questions creates a dilemma as to which part of the question the respondent should respond to (Fife-Schaw, 2000; Rubin & Babbie, 1997; Sarantakos, 1998).

2.8.4.5. Factual questions

The answering of factual questions appears to be straightforward. Respondents, who know an answer, retrieve an answer from memory and record the answer. Others, who do not immediately have an answer, feel compelled to provide an answer. The response is in a way, "*I don't know*" type response. Instead of providing a prior, true attitudinal response, some respondents develop an attitude when posed the question. Motivated and skilled respondents are more likely to answer factual

questions. Those least motivated would answer factual questions correctly or provide some created response (Nadeau & Niemi, 1995). Where *"What if…"* type questions asked, such questions refer to the future and must appear reasonable for the responses to be meaningful. Only when the premise on which the question is based is known to the respondent, can responses be meaningful (Fife-Schaw, 2000).

2.8.4.6. Avoid asking questions on sensitive issues

The sensitive questions are best set towards the end of the instrument (Fife-Schaw, 2000; McDaniel & Gates, 2001; Perreault, 1975-1976; Rubin & Babbie, 1997). As questions become more or are anxiety-arousing or threatening, respondents tend to respond in socially acceptable ways or not responding to such questions (Bradburn, Sudman, Blair & Stocking, 1978; Tourangeau & Smith, 1996). Self-administered pencil and paper instruments and computer assisted data collection methods increase the level of reporting on sensitive issues relative to administration of the same questions by interviewers (Tourangeau & Smith, 1996). The wording of questions influence the responses to questions. The use of words containing particular interpretations, value orientations or associations for particular respondents are likely to influence responses to those items (Bishop, Oldendick & Tuchfarber, 1978; Lockerbie & Borrelli, 1990).

2.8.4.7. Avoid asking leading questions

By indicating what could be regarded as acceptable in questions, leads respondents to provide the *"right response*". Such questions need to be avoided so that bias is avoided in responses (Fife-Schaw, 2000).

2.8.4.8. Avoid asking negative questions

The inclusion of negative items is viewed as a measure to counteract acquiescence response tendencies (Miller & Cleary, 1993; Ory, 1982). However, the use of negative items tends to pave the way for misinterpretation by respondents. The word **"***not"* is often not interpreted as it is intended to be interpreted. Items not read

correctly are likely to produce responses that represent answers not intended (Rubin & Babbie, 1997). The direction of wording influences the metrics positively when written in positive form, though the reason for the positive results are not fully understood (Miller & Cleary, 1993).

2.8.4.9. Keep items short

Long items are often not responded to appropriately by respondents who are not be able to understand long items. In the interests of clarity and ambiguity, items should be kept short and to the point. Items should to be developed so that the items may be read and responded to quickly (Rubin & Babbie, 1997).

2.8.4.10. Keep questions relevant

Questions should be relevant to respondents, especially where attitudes are assessed. Questions relating to issues not important or relevant to the respondent are not likely to deliver responses that are useful (Rubin & Babbie, 1997).

2.8.4.11. Respondents should be able to answer the questions

Respondents must be able to answer questions asked. Where questions cannot be answered consistently and with accuracy, such questions should rather not be asked (Rubin & Babbie, 1997).

2.8.5. Wording effects to consider in item development

The following wording effects may have an impact on responses.

2.8.5.1. Avoid abbreviations, slang, colloquial expressions or jargon

Avoid abbreviations. Not all abbreviations are interpreted correctly by all respondents. Only those abbreviations that have commonly understood meanings should be considered. Ideally, acronyms must be indicated in full (Fink, 1995b).

Vaguely worded items could have more that one interpretation and jargon that is not understood by all the respondents should be avoided (Sarantakos, 1998).

Slang expressions tend to be understood by some respondents and not by others. An instrument is likely to become redundant as words go out of fashion. Use of colloquial expressions often loose their meaning in the explanations of words in the reporting of results to a more general audience (Fink, 1995b; Sarantakos, 1998). Words and sentences need to be selected that do not prejudice respondents or cause biased responses (McDaniel & Gates, 2001).

2.8.5.2. Avoid technical terminology

In the design of questions, the use of technical terminology is often seen as a solution to the problems of ambiguity posed by everyday language. The respondents' ability to answer such questions must be the deciding factor to understand technical language in questions. Use plain language in question wording wherever possible (Fife-Schaw, 2000).

2.8.5.3. Intensifier words

O'Muircheartaigh, Gaskill and Wright (1993) reported that to magnify the meanings of words, intensifier words are used. Words like very, good, satisfied and really could influence respondents to respond in a particular direction on a scale. It is recommended that these words are avoided. They also indicated that the effects of intensifier word effects are dependent on the context in which the words are used. Intensifiers do not create consistent response shifts in all situations. Shifts come about when intensifiers are applied in a particular context.

2.8.5.4. Value judgements

Item wordings should avoid implicit value judgements. The views of sponsors or practitioners should not be expressed or mentioned in items (Fife-Schaw, 2000).

2.8.6. Context effects of instruments

The development and responses to instruments cannot be divorced from the context in which instruments are used. Questions referring to issues that are current in an organisation or other questions in the instrument will influence responses to those questions (Fife-Schaw, 2000).

2.8.7. Hidden assumptions

Items should not contain assumptions where respondents are required to respond to a situation that they have not been exposed to or likely to be exposed to (Fife-Schaw, 2000)

2.9. Respondent friendly design

Making instruments respondent friendly improves the response rate. Respondent friendly design includes instruments that are easy to complete, have clear items, and have clear instructions on how to complete the instruments (Dillman. Sincalair & Clark, 1993; Sanchez, 1992).

2.9.1. Layout of the instruments

In the design, attention must be given to the appearance, physical layout, and font size. Questionnaires should have a professional look, and be well laid out. Instruments should be easily read and complete with company insignia (Jones & Bearley, 1995; Rubin & Babbie, 1997).

Generally, the instrument must be spread out and be uncluttered so that respondents complete the instrument without leaving parts out. The layout should make the completion of the instrument easy to complete (Babbie & Mouton, 2001).

Clear instructions for the completion of the questions is required where instruments are self-administered. Most important are the way in which responses are to be

recorded on the instrument response format (Babbie & Mouton, 2001; Rubin & Babbie, 1997). Text should be easy to read and a font of 12 points or larger should be used (Fife-Schaw, 2000).

2.9.2. Length of instruments

Instruments should not take much time to complete. Instruments should be limited to thirty minutes for completion (McDaniel & Gates, 2001). No magic formula is available to determine the length of an instrument. Excluding biographical items, 80 to 100 items are generally adequate. Instruments should not exceed 150 content–related items (Church & Waclawski, 1998). Instruments should be designed to avoid errors that result from long, unfocused instruments (Jones & Bearley, 1995). The response rate on long instruments is lower than for similar shorter instruments (Dillman, Sinclair, & Clark, 1993).

2.9.3. Ordering of questions

The order of questions could have an effect on the response to questions. The appearance of one question could influence the responses to succeeding questions (McClendon & O'Brein, 1988; Ory, 1982; Perreault, 1975-1976; Rubin & Babbie, 1997). Question-order effects are possible where questions relating to similar issues are asked in direct succession. The problem can partly be dealt with by asking the questions in a random manner (Perreault, 1975-1976: Rubin & Babbie, 1997). In relatively long questionnaires, interesting questions should be asked at the beginning of the questionnaire to engage and maintain the interest of respondents (Rubin & Babbie, 1997). The body of the questionnaire should start with relatively easy items. The more difficult and demanding questions are set towards the middle of the questionnaire. (McDaniel & Gates, 2001).

Schriesheim and DeNisi (1980) suggested that where there is no particular need to randomise items, then the grouping of items could be used to break the monotony of completing long instruments. The grouping and labelling of sections could contribute

to trust and openness by showing that there is no duplication of items to monitor previous responses.

Where the concern of the practitioner is concerned about the convergent and discriminant validity of instruments, the grouping of items and labelling of items have negative effects on the metrics of the instruments (Schriesheim, 1981; Schriesheim & DeNisi, 1980).

In a study, where three separate studies were conducted, the measures ranged from personal satisfaction to leadership behaviour, with different samples and research designs, to measure the effects of labelling and grouping of items. The results indicated increased internal-consistency of reliabilities while negatively influencing the discriminant validity. Grouping of items improves the reliabilities, but the improvements are moderate and were not consistent across the three studies. The researchers concluded that items should not be grouped in the design of items in instruments used in organisations (Schriesheim, Kopelman, & Soloman, 1989).

Where specific and related questions are used together in an instrument, responses to the general questions are likely to be different to response to questions of a more specific nature (Bishop, Oldendick & Tuchfarber, 1985; Willits & Ke, 1995). Where specific questions on an issue were asked first, the effects of the asking specific questions first aid the answering questions of a more general nature (Willits & Ke, 1995).

2.10. Conclusion

The present chapter dealt with literature pertaining to culture and the development of organisation culture instrumentation. The review of the literature commenced with the concept culture in general, and then proceeded to the concept national culture and organisational culture. Models and theories of organisational culture were presented. The metrics of instrumentation were described. Finally, the design of organisational culture instrumentation was outlined.

In the chapter 3, the research design and methodology of the study will be discussed.

Chapter 3

RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

In this chapter, the research design and methodology of the study are outlined. Specific attention will be given to the postulates, research design, the sample of convenience, the measuring instrument, methodology and statistical analyses to be done.

The previous chapter presented a review of literature relating to organisation culture and the characteristics of well-designed organisational culture instruments. The review highlighted the usefulness of having models and theories that would inform the design of organisational culture instruments.

The primary objective of the empirical part study is to examine the features of response scale formats and their usefulness in organisational culture instruments. The aim of the study is to identify which of the three response scale formats (four, five or six-point response scales) would provide the most reliable instrument to assess organisational culture. The data sets on the three response scale formats of Martin's Culture Assessment Instrument were used for comparison.

3.2. Postulates

Three postulates were set for the study (cf. pp. 5-6) and they will be tested empirically:

Postulate 1: Four-point response scale format would yield the poorest metric properties, compared to the five and six-point scales.

Postulate 2: Six-point response scale format would yield the best metric properties, compared to the four and five-point scales.

Postulate 3: Five-point response scale format would yield better metric properties that the four-point scale, but worse that the six-point scale.

3.3. The research design

The research design is informed by the research question, first by establishing what it is that an answer is required for, secondly how to answer the question. To answer questions, either a qualitative or a quantitative approach could be employed (Babbie & Mouton, 2001).

As indicated earlier (cf. p.4), the aim of the current study to establish the metric properties of the four, five and six-point response scales. The answers needed require a quantitative, non-experimental design using secondary data.

3.3.1. Quantitative versus Qualitative research

The differences between qualitative research and quantitative research have been characterised by different foci. Qualitative research relies on the skills of the researcher as an observer or interviewer in respect of gathering data whereas quantitative research relies in the research instruments to gather data and analyse the data (Riley, Wood, Clark, Wilkie & Szivas, 2000).

3.3.1.1. Quantitative research

Kerlinger & Lee (2000) identified the following characteristics of quantitative research. Quantitative research:

- Relies on the on the use of numbers and measurements.
- Focuses on phenomena that can be explained by numbers and statistics.
- Requires the researcher to play a more prominent role in the data gathering process.
- Structures the data collection process.
- Requires a set plan for the completion of research.
- Has a post-positivist tradition.

3.3.1.2. Qualitative research

Kerlinger & Lee (2000) identified the following characteristics of qualitative research. Qualitative research:

- Does not rely on the use of numbers or measurements.
- Focuses on phenomena that cannot be explained adequately with statistics.
- Tends to be less intrusive, and the researcher can work unobtrusively.
- Has a data collection process that is semi-structured. Processes are naturalistic, participatory and interpretative in nature.
- Is more flexible and changes as the data and circumstances change.
- Has a phenomenological perspective.

3.3.2. Experimental versus non-experimental, *ex post facto research*

Welman and Kruger (2001) distinguish between four major types of research designs. These are experimental research, quasi-experimental research, non-experimental research and qualitative research. Of the four research designs mentioned, quantitative research is possible in the experimental research, quasi-experimental and non-experimental research designs.

3.3.2.1. Experimental research

All experiential research has one characteristic in common, the intervention. The unit of analysis, which could be individuals or an organisation, has to be exposed to something that would otherwise not have occurred (Welman & Kruger, 2001).

Welman and Kruger (2001) characterises of true experimental research as:

- Having control over the independent variable in that the levels to be applied in the research.
- The random assignment of units of analysis to groups. The assignment of a unit of analysis is done in a randomised manner.

3.3.2.2. Non-experimental research

In non-experimentation research design, there is an absence of assignment of units of analysis to groups, nor is the intervention planned. In situations where there is regularity and orderliness of the phenomenon under investigation, satisfactory results are often obtained (Welman & Kruger, 2001).

True experimental research is characterised by the assignment of units of analysis to different treatment groups. The purpose of the random assignment is to control known and unknown nuisance variables. In practice the assignment of individuals to one or another group may not be possible or desirable before an intervention is implemented. The nature of the business environment does not allow for pure experimental research. Under such conditions, quasi-experimental research is an option. Within the classification of quasi-experimental research (Welman & Kruger, 2001).

The research design of the study can be classified as non-experimental and *ex post facto* in nature. According to Kerlinger and Lee (2000, p. 558) *"Non-experimental research is systematic empirical inquiry in which the scientist does not have direct control of the independent variable because the manifestations have already occurred or because they are inherently not manipulable. Inferences about relations among the variable are made, without direct intervention, from concomitant variation of independent and dependant variables."*

Characteristics that differentiate experimental from *ex post facto research* include the inability to manipulate independent variable, the lack of power to randomise and the risk of improper interpretation (Kerlinger & Lee, 2000).

Cohen, Manion and Morrison (2000) supported Kerlinger and Lee's (2000) concerns and add the following challenges and opportunities of non-experimental research:

- Researchers have the opportunity to research issues where rigorous experimental conditions are not possible.
- The approach can provide direction for interesting hypotheses that may later be tested by designs that are more rigorous.

- Causative factors are not readily identified.

3.3.3. Secondary data versus primary data

3.3.3.1. Primary data

Primary data is obtained from a direct observation of the phenomenon under investigation or is collected personally (Struwig & Stead, 2001; Welman & Kruger, 2001). To ensure primary data is collected, interviews, personal or telephone, self-administered questionnaires and direct observation methods could be used (Struwig & Stead, 2001). The data are collected by a researcher for a particular purpose (Welman & Kruger, 2001).

3.3.3.2. Secondary data

Secondary data is information collected by individuals or organisations other than the researcher (Struwig & Stead, 2001; Welman & Kruger, 2001). Data is collected by someone else for another project and purpose (Struwig & Stead, 2001).

Ex post facto research, by its nature, relies on secondary data. Mouton (2001) defines secondary data analysis as: *"Using existing data (mostly quantitative), secondary data analysis aim at reanalysing such data in order to test hypothesis or to validate models"* (p. 164).

Mouton (2001) pointed out that secondary data is amenable to statistical analysis. The value of using secondary data is that it saves time and provides the opportunity to reanalyse existing data and arrive at new conclusions. When doing secondary data analysis, there is an opportunity to save on the cost of doing research. However, the limitation is the inability to control errors inherent in the data collected. Finally, the analysis is constrained by the original purpose for collecting the data.

The nature of non-experimental design requires secondary data to be analysed. The data collected in the current study had a common purpose, which was to measure

the organisational culture of organisations. In the context of the present research, the data was considered secondary data.

During the collection of the data, some organisations required customised questions to be included in the instrument. Questions not common to all the questionnnares were removed to ensure that the questions used, are common in the analysis of the data relating to the four, five and six-point response scales. Only 38 common items were retained as a result.

For the purpose of the present research, non-experimental research, *ex post facto* research design is regarded as appropriate to answer the research problem. Secondly, the data of the magnitude obtained, would not ordinarily be available in the course of an experimental research design.

3.4. The sample of convenience

Convenience or opportunity sampling was used in the context of a non-experimental research design. The sample focused on those respondents willing to participate in the research. While the advantage of the approach is to include those willing to participate, the disadvantage is that the results are not representative of the wider population. The generalisation of the results is minimised (Cohen et al., 2000).

The sample for the study comprises members working in different organisations ranging from service oriented organisations to information orientated organisations. The sample is described below. The sample described represents the data common to all the data utilised in the study. From Table 3.1. it is clear that most respondents are male, from different language groups and between 25 – 35 years old.

TABLE 3.1

THE SAMPLE

Characteristics	4-point response scale	5-point response scale	6-point response scale
Gender			
Males	1485	2034	381
Females	36	1879	27
Missing values	150	153	442
Total	**1671**	**4066**	**850**
Afrikaans	330	1014	193
English	111	225	41
Ndebele	4		4
North Sotho	68		31
South Sotho	299		164
Swazi	84		32
Tsongo	134		10
Tswana	174		86
Venda	23		3
Xhosa	264		124
Zulu	108		71
Shangaan			62
Other languages	47	21	1
Missing data	25	2806	28
Total	**1671**	**4066**	**850**
Age			
24 years and younger	112	436	41
25-35 years of age	672	1808	323
36-45 years of age	549	1008	346
46 years of age	306	638	108
Missing data	32	176	32
Total	**1671**	**4066**	**850**

3.5. The measuring instrument

The different response scale formats of the Culture Assessment Instrument (CAI) were used in this study. The instrument was originally developed to measure the organisational culture of a financial institution. The instrument has since been used to assess organisational culture in other South African organisations (Martins & Martins, 2001b).

The reliability of the five-point response scale (Cronbach Alpha) is 0,933. The internal consistency of the culture dimensions measures range from 0,655 to 0,932. Test-retest reliability is between 0,933 and 0,955 (Martins, 2000).

The instrument is modelled on the work of Schein (Martins, 2000). The purpose of the questionnaire was to answer four important questions which a business should ask about itself: -

- Is the business being managed effectively?
- Do the employees understand the mission and its implementation?
- What are the employees' expectations and perceptions about the company?
- Do all job levels, department and language groups support the required organisational culture or are they in conflict with it?

The survey determines the present organisational culture and its elements as found in an organisation which can be an asset or liability to an organisation.

The dimensions measured in the Organisational Culture Instrument include:

- Mission / Vision
- External environment
- Means to objectives
- Management processes
- Employee needs and objectives
- Interpersonal relations
- Leadership

Additional dimensions according to the organisation's needs

- Image of the organisation
- Employment equity
- Diversity
- Customer service
- Policies and procedures (Martins, 2000)

The instrument was initially developed with five-point Likert response-scale-requiring reactions to statements in positive and negative formats. The participant must indicate whether he / she differs or agrees. The points on the scale are marked as follows: Scale point 1, indicates **strongly disagree**, scale point 2 indicates **differ**, scale point 3 indicates **uncertain**, scale point 4 indicates **agree**, and scale point 5 indicates **strongly agree**.

In adapting the instrument for customer requirements, use was made of the four and six-point response scales. The scales marking were:

Four-point response scale were marked, 1 indicated **strongly agree**, 2 indicated **agree**, 3 indicates **disagree** and 4 indicates **strongly disagree**.

Six-point response scale were marked, 1 indicated **strongly agree**, 2, indicates **agree**, 3 indicates **slightly agree**, 4 indicates **slightly disagree**, 5, indicates **disagree** and 6, indicates **strongly disagree**.

The full questionnaire had 79 items.

Examples of the types of questions used in the instrument:

- For the dimension: Client focus.

"I know precisely who our target market and customers are."

- For the dimension: Decision-making:

"When management makes decisions that affect employees, the persons involved are consulted."

An example of the full instrument is found in annexure A.

3.6. Methodology

To achieve the empirical objectives of the study, the following steps were followed in the research process.

TABLE 3.2

METHODOLOGY PROCESS STEPS

Phase	Action
One	A database was developed after the Culture Assessment Instrument was used in different organisational settings. The settings include the application of the three response scales formats, i.e. four, five and six-point response scale format.

TABLE 3.2 CONTINUED

Phase	Action
Two	Questions common to all the organisations were identified. Non-generic items were removed from the data set.
Three	The data sets were checked to ensure the correctness and completeness of the data.
Four	The data were then subjected to statistical analyses using the SPSS program to: • Obtain the descriptive statistics for the respective scales. • Establish the factor structure for the respective response scales using first and second order level factor analyses. • Establish the internal reliability, (Cronbach's alpha) through iterative item analyses.
Five	The analysed information will be reported and interpreted. From the results, recommendations will be made for future research.

3.7. Statistical analysis

With the data available, the data analysis is possible. As indicated earlier, the focus is on the data obtained from the four, five and six-point response scale format on the CAI. The purpose of the approach outlines below is to reduce the data so that conclusions may be drawn.

3.7.1. Descriptive statistics

- The arithmetic mean is the mean of the collection of the scores summated divided by the number of the scores (Huysamen, 1998).
- The standard deviation indicates to what extent, individual scores vary around the arithmetic mean (Huysamen, 1998).
- The median of the scores is the middle score where the scores have been arranged in ascending or descending order (Huysamen, 1998).
- The mode to provides an indication of the interval with the highest frequency of occurring (Huysamen, 1998).

- The variance is an indication of all the differences among the scores in the distribution. The variance of a collection of scores is the mean of the squared deviations from the mean (Huysamen, 1998).
- To establish whether the distribution is positive or negative, the kurtosis is calculated. Kurtosis of at the curve of a distribution refers to the relative flatness or peakedness at the centres of the distribution (Huysamen, 1998).

3.7.2. Factor analysis

Factor analyses will be conducted to reduce the data sets and establish the latent factor structures for each response scale, used in the study. The terminology "factor analysis" is often a generic term used for two different statistical models. The first is component analysis and the second is the factor analysis (Child, 1970; Huysamen, 1978; Mulder, 1989). Hair, Anderson, Tatham & Black (1998) reported that a choice must be exercised as to appropriate factor model. For the purposes of this study, factor analysis is used to determine the latent structure underlying the variables (Child, 1970; Hair et al., 1998; Mulder, 1989).

The strategy followed is informed by the application of Kaiser's (1970) criterion. Based on this criterion a number of factors with eigenvalues greater than unity are postulated. Kaiser's approach is considered the most reliable method especially where large numbers of variables are present (Child, 1970).

Factor rotation is used to enhance the significance, reliability and production of factors (Hair et al., 1998). The purpose with rotation is to obtain a factor matrix where the variables load high on as few factors as possible and that have low loadings on other factors (Huysamen, 1978).

Two types of rotations may be effected, orthogonal and oblique. In the case of orthogonal the rotations, the factors of the rotated factor matrix are independent from each other and the correlation between them are nil. In oblique rotations, the rotated factors are not independent resulting in correlations greater that nil (Huysamen, 1978).

In this study, use will be made of the varimax technique in the extraction of the first level factors. Varimax factors capture the meaning of simple structure within the parameters of an orthogonal framework (Nunnally & Bertstein, 1994).

The factor analysis has as the ultimate goal the identification of factors that describe the variables. Interpretation is the process whereby the factor analysis becomes meaningful. The interpretation and labelling is a subjective process. To enable a meaningful interpretation certain rules would be appropriate:

- Variables with loadings greater than 0,30 will be accepted (Child, 1970; Hair et al., 1998). As indicated earlier, the number of factors that are to be extracted will be done according to Kaiser's criterion (1970).
- The stability of factor loadings are a direct result of sample size. Huysamen (1978) as well as Hair et al. (1998) suggested that there should be five times as many items as expected factors. There should be five times as many participants as the number of items (Huysamen, 1978).
- The inter-correlation matrix will then be subjected to principal axis analysis and an iterative process initiated to determine the factors as indicated above until the factors have converged.

3.8. **Procedure of to be followed for factor analysis**

The procedure used for factor analysis is briefly described in Table 3.3.

TABLE 3.3.

PROCEDURE FOR FACTOR ANALYSING THE DATA

Phase	Activity
One	Analyse the aggregated data to determine the descriptive statistics for the respective response scales.

TABLE 3.3 CONTINUED

Two	To establish if a matrix is appropriate for factor analysis(on both levels), two procedures are to be followed: • Barlett's test of sphericity, that yields a Chi-square value. • The Kaiser-Meyer-Olkin measure of sampling adequacy (MSA) that yields a coefficient. Both tests determine the suitability of a matrix for factor analysis.
Three	Conduct the factor analyses on two levels. First level factor analysis: • Inter-correlate item scores. • Calculate eigenvalues of the unreduced matrix. • Postulate number of factors according to Kaiser's (1970) criterion (extraction of factors is optional). • Calculate sub-scores of the different postulated factors. Second level factor analysis. • Inter-correlate sub-scores. • Calculate eigenvalues of the unreduced matrix. • Postulate number of factors according to Kaiser's (1970) criterion. • Extract factors by using a direct oblimin rotation.
Four	Conduct Iterative item analysis to estimate the reliability of the response scale by calculating, Cronbach's alpha coefficient.
Five	Evaluate the results obtained from the respective response scales and draw conclusions.

3.9. Conclusion

In this chapter, the postulates, research design, the sample of convenience, the measuring instrument, methodology and statistical analysis were outlined.

In the next chapter, the results of the research will be reported.

Chapter 4

RESULTS AND FINDINGS

4.1. Introduction

The previous chapter presented the research design and methodology for the study. The present chapter will report the results obtained after analysing the data. The primary objective of the study is to examine the metric properties of response scales used in the Culture Assessment Instrument (CAI) and the relative usefulness of the response scales in organisation culture assessment.

The aim of the study is to determine what the metric properties are of the four, five and six-point response scales on a set of 38 items completed by different populations. Use is made of factor analysis to establish the factor structures of the respective response scales and an iterative item analysis to establish the reliability of each of the response scales.

The samples of the respective data sets are discussed first, followed by the results of the descriptive statistics and the results of the factor analysis. Finally, the respective reliability coefficients are reported.

4.2. Results pertaining to the four-point response scale

4.2.1. The sample

The data for the four-point response scale originated in an information technology organisation. The biographical information available for the four-point response scale is limited to gender, age and language.

4.2.1.1. Gender

Of the 1671 respondents, 1485 were male respondents and 36 female respondents and 160 respondents or 8,9%, did not respond to the question, In terms of the

sample 88,9% of the respondents were male while 2,2% of the respondents were female.

4.2.1.2. Age

Of the sample, 6,7% were 24 years of age and younger, 40,2% were between 25 and 35 years of age, 32,9% were between the 36 and 40 years of age and 18,3 were 46 years of age and older. Of the sample of 1671 respondents, 1,9% respondents did not answer the question.

4.2.1.3. Language

Of the sample of 1671, 18,7% were Afrikaans, 6,6% were English, 0,2% Ndebele, 3,5% North Sotho, 17,9% were South Sotho, 5,0% were Swazi, 8,0% were Tsonga, 10,4% were Tswana, 1,4 % were Venda, 16,8% were Xhosa, and 6,5% were Zulu, Languages not indicated on the questionnaire accounts for 2,8%, Of the sample, 2,1% did not answer the question.

4.2.2. Descriptive statistics for the four-point scale

An inspection of the statistics for the four-point response scale indicates that the majority of values are negatively skewed. This means that the participants were in agreement with the items in the questionnaire.

TABLE 4.1

FOUR POINT RESPONSE SCALE DESCRIPTIVE STATISTICS

Item	Mean	Median	Mode	Std. deviation	Skew - ness	Std. Error of skewness	Kurtosis	Std. Error of kurtosis
Q 2.	2,86	3,00	3	0,909	-0,564	0,060	-0,392	0,120
Q 3.	2,85	3,00	3	0,902	-0,580	0,060	-0,337	0,120
Q 4.	2,67	3,00	3	0,962	-0,360	0,060	-0,803	0,120
Q 5.	2,39	2,00	3	0,980	0,016	0,060	-1,039	0,120
Q 6.	2,58	3,00	3	1,027	-0,171	0,060	-1,103	0,120
Q 9.	2,69	3,00	3	0,983	-0,308	0,060	-0,905	0,120
Q 10.	2,73	3,00	3	1,066	-0,347	0,060	-1,116	0,120
Q 11.	2,83	3,00	3	0,943	-0,450	0,060	-0,669	0,120
Q 12.	2,41	3,00	3	1,088	0,015	0,060	-1,313	0,120
Q 14.	2,52	3,00	3	1,017	-0,108	0,060	-1,102	0,120
Q 15.	2,77	3,00	3	0,972	-0,497	0,060	-0,694	0,120
Q 16.	2,39	2,00	3	1,038	0,026	0,060	-1,195	0,120

TABLE 4.1 CONTINUED

Item	Mean	Median	Mode	Std. deviation	Skew - ness	Std. Error of skewness	Kurtosis	Std. Error of kurtosis
Q 17.	2,52	3,00	3	0,921	-0,234	0,060	-0,817	0,120
Q 18.	2,47	3,00	3	1,035	-0,078	0,060	-1,169	0,120
Q 20.	2,56	3,00	3	0,971	-0,246	0,060	-0,930	0,120
Q 21.	2,56	3,00	3	1,005	-0,221	0,060	-1,036	0,120
Q 25.	2036	2,00	3	0,915	0,024	0,060	-0,873	0,120
Q 26.	2,39	2,00	3	0,921	-0,041	0,060	-0,898	0,120
Q 31.	2,32	2,00	2	0,988	0,154	0,060	-1,033	0,120
Q 30.	2,45	3,00	3	0,995	-0,098	0,060	-1,078	0,120
Q 32.	2,38	2,00	3	0,987	0,010	0,060	-1,067	0,120
Q 33.	2,37	3,00	3	1,016	-0,101	0,060	-1,211	0,120
Q 34.	2,53	3,00	3	0,996	-0,198	0,060	-1,030	0,120
Q 38.	2,81	3,00	3	0,876	-0,597	0,060	-0,207	0,120
Q 39.	2,72	3,00	3	0,922	-0,450	0,060	-0,583	0,120
Q 40.	2,89	3,00	3	0,833	-0,685	0,060	0,146	0,120
Q 42.	2,79	3,00	3	0,958	-0,544	0,060	-0,592	0,120
Q 43.	2,58	3,00	3	0,929	-0,336	0,060	-0,764	0,120
Q 44.	1,85	1,00	1	0,998	0,791	0,060	-0,657	0,120
Q 47.	2,98	3,00	3	0,877	-0,730	0,060	-0,013	0,120
Q 48.	2,68	3,00	3	0,932	-0,455	0,060	-0,630	0,120
Q 50.	2,82	3,00	3	0,905	-0,548	0,060	-0,392	0,120
Q 51.	3,11	3,00	3	0,903	-0,890	0,060	0,071	0,120
Q 52.	2,58	3,00	3	0,903	-0,270	0,060	-0,704	0,120
Q 53.	2,74	3,00	3	0,907	-0,458	0,060	-0,518	0,120
Q 54.	2,89	3,00	3	0,863	-0,648	0,060	-0,064	0,120
Q 55.	2,93	3,00	3	0,898	-0,628	0,060	-0,274	0,120
Q 56.	2,73	3,00	3	0,948	-0,444	0,060	-0,676	0,120

N = 167 Missing Values = 0 Minimum Value = 1 Maximum Value = 4

4.2.3. Results of the factor analysis for the four-point response scale

The data set for the four-point response scale were factor analysed on two levels according to a procedure suggested by Schepers (1992) in order to determine the factor structure of the instrument. The data was analysed using the SPSS programme.

To determine the suitability of the inter-correlation matrix for factor analysis, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling adequacy (MSA) and Bartlett's Test of Sphericity were conducted on the matrix. The results are reported in Table 4.2. The KMO yielded a MSA of 0,953 and the Bartlett's Test a Chi-square of 22158 (p = 0,000). The matrix is therefore suitable for further factor analysis.

TABLE 4.2
KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin measures of sampling adequacy		0,953
Bartlett's Test of Sphericity	Approximate Chi-square	222158
	df	703
	Significance p(x^2)	0,000

The items of the CAI were inter-correlated and the eigenvalues of the unreduced matrix calculated. Due to the limited space, the inter-correlation matrix is not reported here. The number of factors postulated according to Kaiser's (1970)(eigenvalues greater that unity) criterion are reported in Table 4.3. These seven factors explain about 52% of the variance in the factor space. The item loadings on the seven postulated factors are presented in Table 4.4. The loadings are reported in bold type for each of the factors. Only items with values greater than 0,3 were included in this sorted matrix.

TABLE 4.3

EIGENVALUES ON THE ITEM INTER-CORRELATION MATRIX (38 X 38)

	Initial eigenvalues		
Root	Eigenvalue	% of variance	Cumulative %
1	**11,357**	29,887	29,887
2	**1,929**	5,076	34,962
3	**1,524**	4,011	38,973
4	**1,371**	3,608	42,581
5	**1,356**	3,567	46,148
6	**1,135**	2,986	49,134
7	**1,101**	2,898	52,032
8	0,994	2,616	54,649
9	0,940	2,474	57,123
10	0,884	2,326	59,448
11	0,837	2,204	61,652
12	0,786	2,067	63,719
13	0,763	2,007	65,726
14	0,736	1,937	67,663
15	0,729	1,918	39,581
16	0,687	1,809	71,390
17	0,654	1,702	73,110
18	0,633	1,666	74,776
19	0,625	1,645	76,422
20	0,596	1,568	77,990
21	0,582	1,532	79,522
22	0,573	1,509	81,031
23	0,545	1,434	82,465
24	0,534	1,406	83,871

TABLE 4.3 CONTINUED

	Initial eigenvalues		
Root	Eigenvalue	% of variance	Cumulative %
25	0,522	1,372	85,244
26	0,514	1,353	86,597
27	0,490	1,289	87,886
28	0,474	1,246	89,132
29	0,450	1,185	90,317
30	0,446	1,173	91,490
31	0,441	1,160	92,651
32	0,430	1,133	93,783
33	0,426	1,120	94,903
34	0,413	1,087	95,990
35	0,408	1,072	97,062
36	0,384	1,010	98,072
37	0,371	0,976	99,048
38	0,362	0,952	100,000

TRACE = 38

TABLE 4.4

ITEM LOADINGS ON SEVEN POSTULATED FACTORS

	Factor						
Items	1	2	3	4	5	6	7
48	**0,568**						
56	**0,528**						
52	**0,494**						
39	**0,494**						
55	**0,487**	0,329					
40	**0,464**	0,344					
42	**0,433**						
43	**0,407**						
53		**0,609**					
54		**0,560**					
51	0,325	**0,558**					
50		**0,523**					
47	0,411	**0,471**					
38		**0,431**					
18		**0,399**	0,393				
16			**0,654**				
12			**0,544**				
17			**0,372**				
26	0,306		**0,348**				
44			**0,328**				
15			**0,317**				
32				**0,672**			
33	0,324			**0,494**			
31				**0,480**			0,319
34	0,342			**0,432**			
30				**0,417**			
10					**0,636**		
11		0,326			**0,523**		
9					**0,489**		

TABLE 4.4 CONTINUED

	Factor						
Items	1	2	3	4	5	6	7
21					**0,396**		
14			0,322		**0,335**		
3						**0,610**	
4						**0,505**	
5						**0,384**	0,349
2						**0,381**	
25			0,304	0,308		**0,347**	
20						**0,268**	
6							**0,515**

Sub-scores on each of the postulated factors were calculated by adding item scores. These sub-scores were again inter-correlated and the results are portrayed in Table 4.5.

TABLE 4.5

INTER-CORRELATION OF SUB-SCORES ON SEVEN POSTULATED FACTORS

	Factors						
Sub scores	1	2	3	4	5	6	7
1	1,000	0,680	0,626	0,637	0,566	0,586	0,359
2	0,680	1,000	0,566	0,493	0,598	0,525	0,360
3	0,626	0,566	1,000	0554	0,517	0,568	0,396
4	0,637	0,493	0,554	1,000	0,478	0,546	0,406
5	0,566	0,598	0,517	0,478	1,000	0,497	0,232
6	0,586	0,525	0,568	0,46	0,497	1,000	0,448
7	0,359	0,360	0,396	0,406	0,323	0,448	1,000

All correlations are significant at the p = 0,05 level.

A KMO test for sampling adequacy and a Bartlett's test of sphericity was performed to test the suitability of this matrix for factor analysis. The results are presented in Table 4.6 and indicate that the matrix is suitable for further factor analysis.

TABLE 4.6

KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin measures of sampling adequacy		0,901
Bartlett's Test of Sphericity	Approximate Chi-square	5405,5
	df	21
	Significance p(x^2)	0,000

Eigenvalues were again calculated on this unreduced inter-correlation matrix. Only one factor was postulated according to Kaiser's (1970) criterion (eigenvalues greater

that unity) That accounts for about 59% variance in factor space. The results appear in Table 4.7.

TABLE 4.7

EIGENVALUES ON THE SUB-SCORE INTER-CORRELATION MATRIX (7 X 7)

	Initial eigenvalues		
Root	Eigenvalue	% of variance	Cumulative %
1	**4,100**	58,573	58,573
2	0,768	10,971	69,544
3	0,555	7,928	77,471
4	0,455	6,497	83,969
5	0,440	6,279	90,248
6	0,410	5,858	96,105
7	0,273	3,895	100,000
Trace = 7			

One factor was extracted using principal axis factoring. The loadings of sub-scores on the single factor appear in Table 4.8.

TABLE 4.8

SUB-SCORE LOADINGS ON SECOND LEVEL FACTOR

	Factor Loadings	Communalities
Sub-scores	1	
1	0,831	0,691
2	0,761	0,579
3	0,758	0,574
4	0,735	0,525
5	0,728	0,479
6	0,692	0,540
7	0,508	0,258

Iterative item analyses were conducted on the single obtained scale. The item-test correlations as well as the test reliabilities (Cronbach Alpha) with the respective item deleted, appear in Table 4.9. The obtained single scale yielded a Cronbach Alpha of 0,9345.

4.2.4. Reliability

TABLE 4.9

ITEM RELIABILITY STATISTICS

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item Total correlation	Alpha if item deleted
2	96,8294	396,5332	0,4462	0,9333
3	96,8324	396,1647	0,4611	0,9332
4	97,0150	368,0076	0,4612	0,9332
5	97,2908	369,9693	0,3984	0,9338
6	97,1065	366,2485	0,4745	0,9331
9	96,9916	366,0766	0,5029	0,9328
10	96,9527	369,3337	0,3778	0,9341
11	96,8612	368,6059	0,4547	0,9333
12	97,2795	367,1883	0,4217	0,9337
14	97,1688	363,3248	0,5570	0,9323
15	96,9144	365,6615	0,5206	0,9327
16	97,2974	369,9193	0,5034	0,9328
17	97,1682	368,0046	0,4837	0,9330
18	97,2190	365,9951	0,4772	0,9331
20	97,1239	367,4284	0,4726	0,9331
21	97,1287	365,4415	0,5077	0,9328
25	97,3279	367,5451	0,5010	0,9328
26	97,2974	366,3815	0,5311	0,9326
31	97,3656	366,7051	0,4828	0,9330
30	97,2382	362,2917	0,5987	0,9319
32	97,3004	366,8654	0,4794	0,9331
33	97,3107	367,0634	0,4585	0,9333
34	97,1538	364,0955	0,5488	0,9324
38	96,8749	369,7670	0,4579	0,9332
39	96,9701	363,8817	0,6037	0,9319
40	96,7965	369,5322	0,4910	0,9330
42	96,8971	370,2409	0,4013	0,9338
43	97,1041	363,7173	0,6029	0,9319
44	97,8360	368,5192	0,4293	0,9335
47	96,7050	365,0620	0,6005	0,9320
48	97,0018	361,9862	0,6512	0,9315
50	96,8683	366,6749	0,5326	0,9326
51	96,5709	366,1852	0,5482	0,9324
52	97,1017	366,3238	0,5443	0,9325
53	96,9467	365,6073	0,5627	0,9323
54	96,7923	368,7742	0,4959	0,9329
55	96,7576	364,2939	0,6085	0,9319
56	96,9563	362,7831	0,6165	0,9318

No of cases = 1671 No of items = 38 Cronbach alpha 0,9345

4.2.5. Findings of the four-point response scale

The following observations were made with regard to the four-point scale.

4.2.5.1. Descriptive statistics for the four-point response scale

The item statistics for the four-point response scale indicate that most of the items were negatively skewed indicating that most of the respondents were in agreement with the statements posed in the CAI.

4.2.5.2. Validity

The factor analysis of the four-point scale is based on the records of 1671 cases. All the items loaded on a single second level factor. On the first order analysis, the items loaded on various aspects of culture according to factor content. At the first level analysis, seven factors emerged. The number of items loading on each of the factors is highest for factor one and less for the remaining factors, owing to the possible creation of artefactors (Schepers, 1992). A single descriptive label could not be assigned to any of the first level factors. A second level factor analysis was computed and a single second level factor emerged. From the descriptions of the first level factors, there is evidence of significant loadings, on a single factor that represents the construct culture.

4.2.4.3. Reliability

A Cronbach Alpha 0,9345 was calculated. The Alpha values if an item is deleted are of the order of 0,93 for all the items. Cortina (1993) indicated that a Cronbach Alpha of 0,7 and more is significant.

4.3. Results pertaining to the five-point response scale

4.3.1. The sample

The data for the five-point response scale was obtained in a number of organisations. The sample was composed of 26% respondents from financial services organisation A, 5,4% from financial organisation services B, from a retail organisation 2,9% and 6,2% from an information services organisation and 60,6% from a postal services organisation. A total of 4066 respondents completed the instrument.

The biographical data available for the sample includes data relating to race, age, gender and language.

4.3.1.1. Race

Of the sample 26,7% were White, 7,2% were, Coloured, 3,1% were, Indian, and 22,4% were Black. Of the 4066 respondents, 40,6% did not complete the question.

4.3.1.2. Age

Of the sample of 10,8% were 24 years of age and younger, 44,6% were 25 to 35 years of age, 24,7% were between 36 to 45 years of age and 15,7% were 46 years of age and older. Of the sample of 4066, 4,3% did not complete the question.

4.3.1.3. Gender

The distribution of males and females was almost equal, Of the sample of 4066, 50,0% were males and 46,1% were female. Of the sample of 4066, 3,8% did not complete the question.

4.3.1.4. Language

Of the sample of 4066, 24,9 % of the respondents indicated they were Afrikaans speaking, and 5,5% indicates they were English speaking, Of the sample of 4066, 0,5% indicated that they spoke other languages. A significant 69,0% of the respondents did not complete the question.

4.3.2. Descriptive statistics for the five-point scale

An inspection of the statistics indicate that the majority of the items are negatively skewed.

TABLE 4.10

FIVE-POINT RESPONSE SCALE DESCRIPTIVE STATISTICS

Item	Mean	Median	Mode	Std. deviation	Skew - ness	Std. Error of skewness	Kurtosis	Std. Error of kurtosis
Q 2.	3,93	4,00	4	0,904	-1,135	0,038	1,418	0,077
Q 3.	3,82	4,00	4	1,092	-0,959	0,038	0,161	0,077
Q 4.	3,32	4,00	4	1,236	-0,443	0,038	-1,005	0,077
Q 5.	2,82	3,00	2	1,214	-0,114	0,038	-1,043	0,077
Q 6.	3,06	3,00	4	1,394	-0,148	0,038	-1,381	0,077
Q 9.	3,41	4,00	4	1,236	-0,462	0,038	-1,033	0,077
Q 10.	3,33	4,00	4	1,370	-0,375	0,038	-1,192	0,077
Q 11.	3,40	4,00	4	1,243	-0,430	0,038	-1,020	0,077
Q 12.	3,80	4,00	4	1,217	-0,988	0,038	-0,045	0,077
Q 14.	2,99	3,00	4	1,340	-0,084	0,038	-1,376	0,077
Q 15.	3,72	4,00	4	1,241	-0,899	0,038	-0,290	0,077
Q 16.	2,88	3,00	4	1,385	-0,011	0,038	-1,375	0,077
Q 17.	2,83	3,00	2	1,197	0,044	0,038	-1,045	0,077
Q 18.	3,01	3,00	4	1,371	-0,194	0,038	-1,307	0,077
Q 20.	3,58	4,00	4	1,047	-0,664	0,038	-0,160	0,077
Q 21.	3,03	3,00	4	1,336	-0,104	0,038	-1,257	0,077
Q 25.	3,14	3,00	4	1,181	-0262	0,038	-1,039	0,077
Q 26.	3,21	4,00	4	1,253	-0,379	0,038	-1,053	0,077
Q 31.	2,86	3,00	4	1,246	0,032	0,038	-1,274	0,077
Q 30.	2,74	2,00	4	1,323	0,123	0,038	-1,349	0,077
Q 32.	2,98	3,00	4	1,254	-0,137	0,038	-1,213	0,077
Q 33.	3,40	4,00	4	1,191	-0,625	0,038	-0,708	0,077
Q 34.	3,32	4,00	4	1,139	-0,450	0,038	-0,854	0,077
Q 38.	3,16	3,00	4	1,171	-0,272	0,038	-0,943	0,077
Q 39.	3,68	4,00	4	1,018	-0,827	0,038	0,035	0,077
Q 40.	3,30	4,00	4	1,281	-0,483	0,038	-0,985	0,077
Q 42.	3,23	4,00	4	1,441	-0,343	0,038	-1,322	0,077
Q 43.	2,81	3,00	4	1,292	-0,019	0,038	-1,291	0,077
Q 44.	2,59	2,00	2	1,253	0,283	0,038	-1,181	0,077
Q 47.	3,53	4,00	4	1,114	-0,765	0,038	-0,303	0,077
Q 48.	3,35	4,00	4	1,211	-0,536	0,038	-0,810	0,077
Q 50.	3,79	4,00	4	1,170	-0,904	0,038	-0,152	0,077
Q 51.	3,44	4,00	4	1,132	-0,583	0,038	-0,611	0,077
Q 52.	2,95	3,00	4	1,168	-0,109	0,038	-1,103	0,077
Q 53.	3,41	4,00	4	1,131	-0,583	0,038	-0,696	0,077
Q 54.	3,41	4,00	4	1,131	-0,583	0,038	-0,622	0,077
Q 55.	3,41	4,00	4	1,229	-0,540	0,038	-0,784	0,077
Q 56.	3,17	4,00	4	1,387	-0,239	0,038	-1,314	0,077

N = 4066 Missing values = 0 Minimum value = 1 Maximum value = 5

4.3.3. Results of the factor analysis of the five-point-scale

The data set for the five-point response scale were factor analysed on two levels according to a procedure suggested by Schepers (1992) in order to determine the factor structure of the instrument. The data was analysed using the SPSS programme.

To determine the suitability of the inter-correlation matrix for factor analysis, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling adequacy (MSA) and Bartlett's Test of Sphericity were conducted on the matrix. The results are reported in Table 4.11. The KMO yielded a MSA of 0,960 and the Bartlett's Test a Chi-square of 47436 (p = 0,000). The matrix is suitable for further factor analysis.

TABLE 4.11

KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin measures of sampling adequacy		0,960
Bartlett's Test of Sphericity	Approximate Chi-square	47436
	df	703
	Significance p(x^2)	0,000

The items of the CAI were inter-correlated and the eigenvalues of the unreduced matrix calculated. Due to the limited space, the inter-correlation matrix is not reported here. The number of factors postulated according to Kaiser's (1970)(eigenvalues greater that unity) criterion are reported in Table 4.12. These six factors explain about 47% of the variance in the factor space. The item loadings on the six postulated factors are presented in Table 4.13. The loadings are reported in bold type for each of the factors. Only items with values greater than 0,3 were included in this sorted matrix.

TABLE 4.12

EIGENVALUES ON THE ITEM INTER-CORRELATION MATRIX (38 X 38)

	Initial eigenvalues		
Root	Eigenvalue	% of variance	Cumulative %
1	**10,529**	27,709	27,709
2	**2,013**	5,297	33,006
3	**1,627**	4,282	37,288
4	**1,313**	3,454	40,742
5	**1,170**	3,080	43,822
6	**1,134**	2,985	46,808
7	0,986	2,596	49,403
8	0,929	2,445	51,849
9	0,884	2,327	54,176
10	0,853	2,245	56,421
11	0,808	2,153	58,574
12	0,788	2,125	60,699
13	0,771	2,074	62,773
14	0,745	2,029	64,802
15	0,731	1,960	66,762

TABLE 4.12 CONTINUED

Initial eigenvalues			
Root	Eigenvalue	% of variance	Cumulative %
16	0,718	1,923	68,685
17	0,699	1,890	70,575
18	0,693	1,839	72,414
19	0,648	1,824	74,239
20	0,624	1,706	75,945
21	0,624	1,643	77,588
22	0,615	1,618	79,206
23	0,601	1,583	80,789
24	0,593	1,560	82,345
25	0,584	1,538	83,667
26	0,573	1,507	85,393
27	0,558	1,467	86,860
28	0,529	1,391	88,252
29	0,508	1,337	89,589
30	0,507	1,334	90,923
31	0,488	1,284	92,206
32	0,471	1,239	93,446
33	0,464	1,221	94,667
34	0,431	1,134	95,801
35	0,424	1,115	96,916
36	0,412	1,085	98,001
37	0,399	1,049	99,050
38	0,361	0,950	100,00
TRACE = 38			

Table 4.13

ITEM LOADINGS ON SIX POSTULATED FACTORS

	Factor					
Items	1	2	3	4	5	6
16	**0,611**					
18	**0,609**					
42	**0,606**					0,332
40	**0,573**					
17	**0,565**					
26	**0,553**					
55	**0,506**					0,362
48	**0,424**	0,306				
43	**0,421**					
25	**0,419**					
14	**0,335**					
38	**0,296**					
44	0,312	**0,476**				
34		**0,458**				
50		**0,449**				
20		**0,429**				
53		**0,421**				
39		**0,412**				
21	0,362	**0,385**	0,330			
15		**0,354**				
11			**0,697**			

Table 4.13 Continued

	Factor					
Items	1	2	3	4	5	6
10	0,302		**0,631**			
9			**0,585**			
12						
6				**0,499**		
4				**0,497**		
5				**0,490**		
3				**0,461**		
2				**0,370**		
30					**0,491**	
31					**0,496**	
32					**0,447**	
47	0,307				**0,318**	
33						
51						**0,429**
54		0,339				**0,401**
52						**0,381**
56						**0,353**

Sub-scores on each of the postulated factors were calculated by adding item scores. These scores were again inter-correlated and the results are portrayed in Table 4.14.

TABLE 4.14

INTER CORRELATION MATRIX OF SUB-SCORES ON SIX POSTULATED FACTORS (6 X 6)

	Factor					
Factors	1	2	3	4	5	6
1	1,000	0,575	0,559	0,500	0,682	0,542
2	0,575	1,000	0,493	0,475	0,574	0,389
3	0,559	0,493	1,000	0,360	0,439	0,332
4	0,500	0,475	0,360	1,000	0,517	0,340
5	0,682	0,574	0,439	0,517	1,000	0,460
6	0,542	0,389	0,332	0,340	0,460	1,000

All correlations are significant at the p = 0,05 level.

A KMO test for sampling adequacy and Bartlett's test for sphericity was performed to test the suitability of this matrix for factor analysis. The results are presented in Table 4.15 and indicate that the matrix is suitable for further factor analysis.

TABLE 4.15

KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin measures of sampling adequacy		0,866
Bartlett's Test of Sphericity	Approximate Chi-square	95551,2
	df	15
	Significance p(x^2)	0,000

Eigenvalues were again calculated on this unreduced inter-correlation matrix. Only one factor was postulated according to Kaiser's (1970) criterion (eigenvalues greater that unity) That accounts for about 57% variance in factor space. The results appear in Table 4.16.

TABLE 4.16

EIGENVALUES ON THE SUB-SCORE INTER-CORRELATION MATRIX (6 X 6)

	Initial eigenvalues		
Root	Eigenvalue	% of variance	Cumulative %
1	**3,440**	57,339	57,339
2	0,694	11,566	68,905
3	0,655	10,919	79,824
4	0,488	8,139	87,963
5	0,437	7,277	95,240
6	0,286	4,760	100,00
Trace = 6			

One factor was extracted using principal axis factoring. The loadings of sub-scores on the single factor appear in Table 4.17.

TABLE 4.17

SUB-SCORE LOADINGS ON THE SECOND LEVEL FACTOR

	Factor loadings	Communalites
Sub-scores	1	
1	0,858	0,736
2	0,789	0,520
3	0,721	0,379
4	0,617	0,380
5	0,615	0,623
6	0,577	0,333

4.3.4. Reliability

Iterative item analyses were conducted on the single obtained scale. The item-test correlations as well as the test reliabilities (Cronbach Alpha) with the respective items deleted appear in Table 4.18. The obtained single scale yielded a Cronbach Alpha of 0,9248.

TABLE 4.18

ITEM RELIABILITY STATISTICS

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item Total correlation	Alpha if item deleted
2	119,9764	566,1874	0,2836	0,9246
3	120,0821	562,6545	0,2964	0,9247
4	120,5831	547,7880	0,5165	0,9225
5	121,0876	553,2834	0,4282	0,9236
6	120,8689	547,5689	0,4553	0,9232
9	120,4889	547,2330	0,5116	0,9226
10	120,5780	546,8634	0,4754	0,9230
11	120,5010	548,5359	0,5000	0,9227
12	120,1008	555,9539	0,3793	0,9240
14	120,9129	549,9821	0,4363	0,9234
15	120,1840	559,3447	0,3120	0,9247
16	121,0189	539,0533	0,5947	0,9215
17	121,0760	543,4464	0,6151	0,9215
18	120,8947	540,7938	0,5728	0,9218
20	120,3232	561,1290	0,3423	0,9242
21	120,8756	542,3004	0,5642	0,9219
25	120,7641	546,0833	0,5750	0,9219
26	120,6904	538,8682	0,6662	0,9209
31	121,0401	547,6995	0,5138	0,9225
30	121,1596	540,0791	0,6080	0,9214
32	120,9225	547,0875	0,5208	0,9225
33	120,5049	555,2311	0,4018	0,9237
34	120,5856	555,4934	0,4177	0,9235
38	120,7469	554,3386	0,4262	0,9235
39	120,2226	546,5996	0,2806	0,9247
40	120,6058	539,9269	0,6322	0,9212
42	120,6242	543,6939	0,4974	0,9228
43	121,0935	548,9256	0,4727	0,9230
44	121,3180	549,6890	0,4755	0,9230
47	120,3684	548,4453	0,5656	0,9221
48	120,5553	544,0846	0,5956	0,9217
50	120,1178	551,6636	0,4763	0,9230
51	120,4678	548,7199	0,5506	0,9222
52	120,9501	555,2297	0,4108	0,9236
53	120,4338	551,1426	0,4883	0,9228
54	120,4934	552,9482	0,4696	0,9230
55	120,4899	542,4661	0,6156	0,9214
56	120,7381	570,5555	0,1015	0,9274
No of cases = 4066		No of items = 38	Cronbach alpha	0,9248

4.3.5. Findings of the five-point response scale

The following observations were made with regard to the five-point scale.

4.3.5.1. The descriptive statistics

The item statistics for the five-point response scale indicate that most of the item were negatively skewed indicating that most of the respondents were in agreement with the statement posed in the CAI.

4.3.5.2. Factor analysis

The factor analysis of the five-point scale is based on the records of 4066 cases. All the items loaded on a single second level factor. The results were according to expectations.

On the first order analysis, the items loaded on various aspects of culture according to factor content. At the first level analysis, six factors emerged. The number of items loading on each of the factors is highest for factor one and least for the remaining factors. A single descriptive label could not be assigned to any of the first level factors, owing to the possible creation of artefactors (Schepers, 1992). A second level factor analysis was done and a single second level factor emerged. From the descriptions of the first level factors, there is evidence that there are significant loadings, on a single factor, that represents the construct culture.

4.3.5.3. Reliability

A Cronbach Alpha 0,9248 was calculated. The Alpha values if an item is deleted are of the order of 0,92 for all the items. Cortina (1993) indicated that a Cronbach Alpha of 0,7 and more is significant.

4.4. Results pertaining to the six-point scale

4.4.1. The sample

The data from the six-point scale was obtained from three mining organisations. Of the sample of 850 respondents, 48,8% respondents were from mine number 1, 16,6% were from mine number 2 and 34,7% were from mine number 3.

The biographical data available for the sample includes data relating to length of service, age, education, gender and language.

4.4.1.1. Length of service

Of the sample of 850 respondents, 10,5% had less than one year's service, 13,2% had between one and three year's service, 32,7% between four and ten years service and 37,6% had more than ten year's service. Of the sample of 850 respondents, 6% did not complete the question.

4.4.1.2. Age

Of the sample, 4,8% were 24 years of age or younger, 38% were between 25 to 35 years of age, 40,7% were between 36 and 45 years of age and 12,7% were 46 years and older. Of the sample of 850, 3,6% did not complete the question.

4.4.1.3. Education

Of the sample, 34,6% were educated at a level lower than standard six, 16,1%, has a standards six or N1 qualification, 20,4% had a standard 8 or N 2 qualification, 19,4% had a standard ten or N3 qualification, 5,5% had a National Diploma, T4 to T6 or a degree. Of the sample of 850, 3,6 % did not complete the question.

4.4.1.4. Gender

Of the sample, 44,8% percent were male and 3,2% were female. Of the sample of 850, 52,0% did not complete the question.

4.4.1.5. Language

Of the sample, 22,7% were Afrikaans, 4,8% were English, 4,8%, Ndebele 0,6%, North Sotho 3,6%, South Sotho 19,3%, Swazi 3,8%, Tsonga 1,2%, Tswana 10,1%, Venda 0,4%, Xhosa 14,6%, Zulu 8,4%, Shangaan 7,3% and other language 0,1%. Of the sample of 850, 3,3% did not complete the question.

4.4.2. The descriptive statistics

An inspection of the statistics indicate that the majority of the items are negatively skewed

TABLE 4.19

SIX-POINT RESPONSE SCALE DESCRIPTIVE STATISTICS

Item	Mean	Median	Mode	Std. deviation	Skew - ness	Std. Error of skewness	Kurtosis	Std. Error of kurtosis
Q 2.	3,70	4,00	5	1,682	-0,402	0,084	-1,279	0,168
Q 3.	4,18	5,00	5	1,461	-0,780	0,084	-0,455	0,168
Q 4.	3,78	4,00	5	1,537	-0,530	0,084	-0,923	0,168
Q 5.	3,61	4,00	5	1,597	-0,315	0,084	-1,223	0,168
Q 6	3,58	4,00	5	1,644	-0,251	0,084	-1,253	0,168
Q 9.	4,41	5,00	5	1,495	-0,663	0,084	-0,683	0,168
Q 10.	4,15	5,00	5	1,547	-0,647	0,084	-0,768	0,168
Q 11.	4,22	5,00	5	1,391	-0,726	0,084	-0,368	0,168
Q 12.	4,16	5,00	5	1,646	-0,652	0,084	-0,847	0,168
Q 14.	3,59	4,00	5	1,569	-0,223	0,084	-1,210	0,168
Q 15.	4,33	5,00	5	1,329	-0,885	0,084	0,054	0,168
Q 16.	3,61	4,00	5	1,649	-0,204	0,084	-1,286	0,168
Q 17.	3,38	4,00	4	1,469	-0.150	0,084	-1,105	0,168
Q 18.	3,53	4,00	5	1,695	-0,158	0,084	-1,344	0,168
Q 20.	3,77	4,00	5	1,454	-0,502	0,084	-0,894	0,168
Q 21.	3,26	3,00	5	1,595	0,089	0,084	-1,233	0,168
Q 25.	3,51	4,00	5	1,516	-0,251	0,084	-1,156	0,168
Q 26.	3,66	4,00	5	1,562	-0,329	0,084	-1,189	0,168
Q 31.	3,31	4,00	4	1,513	-0,063	0,084	-1,185	0,168
Q 30.	3,59	4,00	5	1,551	-0,358	0,084	-1,129	0,168
Q 32.	3,26	3,00	4	1,528	-0,041	0,084	-1,252	0,168
Q 33.	3,47	4,00	5	1,585	-0,213	0,084	-1,271	0,168
Q 34.	,076	4,00	5	1,534	-0,362	0,084	-1,014	0,168
Q 38.	4,23	5,00	5	1,340	-0,869	0,084	-0,101	0,168
Q 39.	4,00	4,00	5	1,365	-0,587	0,084	-0,641	0,168
Q 40.	4,25	5,00	5	1,317	-0,845	0,084	-0,055	0,168
Q 42.	4,47	5,00	5	1,551	-1,062	0,084	-0,007	0,168
Q 43.	3,90	4,00	5	1,301	-0,644	0,084	-0,460	0,168
Q 44.	2,98	3,00	1	1,614	0,226	0,084	-1,335	0,168
Q 47.	4,33	5,00	5	1,299	-0,932	0,084	0,183	0,168
Q 48.	3,91	4,00	5	1,507	-0,598	0,084	-0,777	0,168
Q 50.	4,13	5,00	5	1,305	-0,784	0,084	-0,241	0,168
Q 51.	4,62	5,00	5	1,284	-1,055	0,084	0,407	0,168
Q 52.	3,84	4,00	5	1,367	-0,615	0,084	-0,608	0,168
Q53	4,00	4,00	5	1,469	-0,535	0,084	-0,850	0,168
Q 54.	4,11	4,00	5	1,421	-0,558	0,084	-0,659	0,168
Q 55.	3,91	4,00	5	1,483	-0,566	0,084	-0,779	0,168
Q 56.	3,96	5,00	5	1,461	-0,678	0,084	-0,750	0,168

4.4.3. The results of the factor analysis

The data set for the six-point response scale were factor analysed on two levels according to a procedure suggested by Schepers (1992) in order to determine the

factor structure of the instrument. The data was analysed using the SPSS programme.

To determine the suitability of the inter-correlation matrix for factor analysis, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling adequacy (MSA) and Bartlett's Test of Sphericity were conducted on the matrix. The results are reported in Table 4.20. The KMO yielded a MSA of 0,938 and the Barlett Test a Chi-square of 12571 (p = 0,000). The matrix is suitable for further factor analysis.

TABLE 4.20

KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin measures of sampling adequacy		0,938
Bartlett's Test of Sphericity	Approximate Chi-square	12571
	df	703
	Significance p(x^2)	0,000

The items of the CAI were inter-correlated and the eigenvalues of the unreduced matrix calculated. Due to the limited space, the inter-correlation matrix is not reported here. The number of factors postulated according to Kaiser's (1970)(eigenvalues greater that unity) criterion are reported in Table 4.21. These six factors explain about 52% of the variance in the factor space. The item loadings on the six postulated factors are presented in Table 4.22. The loadings are reported in bold type for each of the factors. Only five factors yielded significant item loadings. Factor five was non-determined, having only one significant loading. Only items with values greater than 0,3 were included in this unreduced matrix.

TABLE 4.21

EIGENVALAUES ON THE ITEM INTER-CORRELATION MATRIX (38 X 38)

	Initial eigenvalues		
Root	Eigenvalue	% of variance	Cumulative %
1	**10,666**	28,068	28,068
2	**3,644**	9,589	37,657
3	**1,770**	4,657	42,314
4	**1,483**	3,903	46,216
5	**1,158**	3,048	49,264
6	**1,087**	2,861	52,125
7	0,997	2,622	54,747
8	0,908	2,391	57,138

TABLE 4.21 CONTINUED

Initial eigenvalues			
Root	Eigenvalue	% of variance	Cumulative %
9	0,892	2,347	59,485
10	0,849	2,233	61,718
11	0,807	2,124	63,842
12	0,781	2,055	65,897
13	0,735	1,934	67,830
14	0,729	1,918	69,748
15	0,682	1,796	71,544
16	0,668	1,758	73,302
17	0,657	1,729	75,031
18	0,638	1,680	76,711
19	0,625	1,646	78,357
20	0,581	1,529	79,886
21	0,562	1,478	81,364
22	0,537	1,412	82,776
23	0,524	1,378	84,154
24	0,517	1,360	85,514
25	0,500	1,315	86,829
26	0,478	1,258	88,088
27	0,463	1,218	89,306
28	0,447	1,177	90,483
29	0,430	1,131	91,614
30	0,427	1,123	92,738
31	0,396	1,043	93,781
32	0,387	1,017	94,798
33	0,364	0,958	95,756
34	0,361	0,949	96,705
35	0,341	0,897	97,602
36	0,321	0,845	98,447
37	0,310	0,817	99,264
38	0,280	0,736	100,000
Trace = 38			

TABLE 4.22

ITEM LOADINGS ON SIX POSTULATED FACTORS (6X6)

Item	1	2	3	4	5	6
55	**0,727**					
26	**0,719**					
56	**0,669**					
17	**0,662**					
33	**0,658**					
25	**0,646**					
16	**0,642**					
32	**0,611**					
18	**0,567**					
30	**0,531**		0,327			
21	**0,527**					
48	**0,464**					0,419
4	**0,463**					
52	**0,461**	0,345				

TABLE 4.22. CONTINUED

Item	1	2	3	4	5	6
42	**0,444**					
14	**0,441**					
44	**0,441**					
31	**0,427**		0,344		0,360	
20	**0,336**		0,302			0,087
54		**0,691**				
53		**0,652**				
50		**0,607**				
51		**0,591**				
40		**0,584**				
38		**0,563**				
47		**0,533**				
39	0,328	**0,439**				
15		**0,424**				
43	0,355	**0,380**				
9		**0,380**				
5			**0,686**			
6			**0,478**			
3			**0,472**			
10				**0,645**		
11		0,375		**0,574**		
12				**0,568**		
2	0,342			**-0,385**		
34		0,335			**0,516**	

Sub-scores on each of the five postulated factors were calculated by adding item scores. These sub-scores were again inter-correlated and the results are portrayed in Table 4.23.

TABLE 4.23

INTER-CORRELATION MATRIX OF SUB-SCORES ON FIVE POSTULATED FACTORS (5 X 5)

	1	2	3	4	5
1	1,000	0.522	0.516	0.026	0.342
2	0.522	1,000	0.301	0.356	0.452
3	0.516	0.301	1,000	-0.30	0.194
4	0.26	0.356	-0.30	1,000	0.313
5	0.343	0.452	0.194	0.131	1,000

All correlation are significant ate the p = 0,05 level.

A KMO test for sampling adequacy and a Bartlett's Test of sphericity was performed to test the suitability of this matrix for factor analysis. The results are presented in Table 4.24 and indicate that the matrix is suitable for further factor analysis.

TABLE 4.24

KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin measures of sampling adequacy		0,662
Bartlett's Test of Sphericity	Approximate Chi-square	939,17
	df	10
	Significance p(x^2)	0,000

Eigenvalues were again calculated on this unreduced inter-correlation matrix. Two factors were postulated according to Kaiser's (1970) criterion (eigenvalues greater that unity). These account for about 70% variance in factor space. The results appear in Table 4.25.

Table 4.25

EIGENVALUES ON THE SUB-SCORE INTER-CORRELATION MATRIX (5 X 5)

Initial eigenvalues			
Root	Eigenvalues	% of variance	Cumulative %
1	**2,273**	45,450	45,450
2	**1,210**	24,202	69,652
3	0,620	12,401	82,053
4	0,538	10,754	92,807
5	0,360	7,193	100,000
Trace = 5			

Two factors were extracted using principal axis factoring. The loadings on the sub-scores appear in Table 4.26.

TABLE 4.26

SUB-SCORES ON THE SECOND LEVEL FACTOR

	Factors loadings	
Sub-scores	1	2
1	**0.889**	0.278
2	**0.582**	0.113
3	**0.564**	**0.662**
4	0.002	**0.646**
5	0.368	**0.547**

The scores were inter-correlated and the results portrayed in Table 4.27. Factor 2 is non-determined. In order to create an equal base for comparison, the factor analysis was forced into a single factor solution.

TABLE 4.27

FACTOR CORRELATION MATRIX

	Factor	
Factor	1	2
1	1,000	0,272
2	0,272	1,000

One factor was extracted using principal axis factoring. The loadings of the sub-scores on a single factor appear in Table 4.28.

TABLE 4.28

SUB-SCORE LOADINGS ON THE SECOND LEVEL FACTOR

	Factor	Communalities
Sub scores	1	
1	0,806	0.649
2	0,686	0.470
3	0,527	0.278
4	0,493	0.243

Iterative item analyses were conducted on the single obtained scale. The item-test correlations as well as the test reliabilities (Cronbach Alpha) with the respective item deleted appear in Table 4.29. The obtained single scale yielded a Cronbach Alpha of 0,9273.

4.4.4. Reliability

TABLE 4.29

ITEM RELIABILITY STATISTICS

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item Total correlation	Alpha if item deleted
55	126,0412	700,8758	0,6000	0,9241
26	126,2941	694,7944	0,6428	0,9235

TABLE 4.29 CONTINUED

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item - Total correlation	Alpha if item deleted
56	125,9918	704,6654	0,5593	0,9246
17	126,5682	699,8946	0,6190	0,9239
33	126,4800	695,5196	0,6239	0,9237
25	126,4424	701,5756	0,5763	0,9243
16	126,3512	696,2085	0,5889	0,9241
32	126,6859	699,5278	0,5975	0,9241
18	126,4235	696,9912	0,5623	0,9245
30	126,3612	695,7599	0,6357	0,9236
21	126,6929	701,3131	0,5484	0,9247
48	126,0424	702,9287	0,5630	0,9245
4	126,1718	704,1236	0,5355	0,9248
2	126,1141	704,5347	0,6032	0,9242
42	125,4812	712,8766	0,4213	0,9262
14	126,3612	707,3829	0,4832	0,9255
44	126,9694	707,1062	0,4714	0,9256
31	126,6376	705,8709	0,5227	0,9250
20	126,1776	712,0874	0,4635	0,9256
54	125,8376	718,1314	0,3943	0,9264
53	125,9471	720,3329	0,3509	0,9269
50	125,8224	713,2487	0,5054	0,9252
51	125,3341	715,6974	0,4779	0,9255
40	125,7012	722,9565	0,3597	0,9267
38	125,7165	716,3706	0,4462	0,9258
47	125,6224	715,6464	0,4723	0,9256
39	125,9541	709,2146	0,5379	0,9249
15	125,6212	718,9824	0,4128	0,9262
43	126,0541	711,4411	0,5337	0,9249
9	125,8129	716,4868	0,3930	0,9265
5	126,3376	715,0508	0,3813	0,9267
6	126,3753	708,5851	0,4440	0,9260
3	125,7694	721,1694	0,3424	0,9270
4	126,1859	713,1715	0,4230	0,9262
No of cases = 850	No of items = 34		Cronbach alpha	0,9273

4.4.5. Findings on the six-point response scale

The following observations are made with regard to the six-point scale.

4.4.5.1. The descriptive statistics

The item statistics for the six-point response scale indicate that most of the item were negatively skewed indicating that most of the respondents were in agreement with the statement posed in the CAI.

4.4.5.2. Factor analysis

The factor analysis of the six-point scale is based on the records of 850 records. All the items loaded on a forced single factor.

On the first level analysis, the items loaded on various aspects of culture according to factor content. At the first level of analysis, six factors emerged. The numbers of items loading on each of the factors is highest for factor one and less for the remaining factors. A single descriptive label could not be assigned to any of the first level factors, owing to the possible creation of artefactors (Schepers, 1992). A second level factor analysis was done and two second level factors emerged. Hence, a forced single factor solution was calculated. From the descriptions of the first level factors, there is evidence that there are significant loadings on this single factor, which represents the construct culture.

4.4.5.3. Reliability

A Cronbach Alpha 0,9273 was calculated. The Alpha values if an item is deleted are of the order of 0,92 for all the items. Cortina (1993) indicated that a Cronbach Alpha of 0,7 and more is significant.

4.5. Overall comparative findings of the four, five and six-point response scales

4.5.1. The descriptive statistics

The item statistics for the respective response scales indicate that most of the items were negatively skewed indicating that most of the respondents were in agreement with the statements posed in the CAI.

4.5.2. Factor analysis

The factor structure are similar on the second level analysis, with a single factor extracted in each of the respective scales, except for the six-point scale where a single factor solution was forced.

4.5.3. Reliability

TABLE 4.30

RANGES OF ITEM RELIABILITY STATISTICS

Response scale	Range of scale means if item deleted		Range of scale variances if item deleted		Range of corrected item - total correlation		Range of Alpha scores if item deleted		Cronbach Alpha
	Low	High	Low	High	Low	High	Low	High	
Four-point	96,5709	97,9360	361,9862	396,5332	0,3778	0,6512	0,9315	0,9338	0,9345
Five-point	119,9764	120,9501	540,7938	561,1290	0,1015	0,6662	0,9212	0.9247	0,9248
Six-point	125,3341	126,9694	695,5196	718,1314	O,3424	0,6428	0,9235	O,9269	0,9273

The Alpha values of the respective response scales all have high reliabilities that exceed 0,7. Values more than 0,7 are significant (Cortina, 1993). The literature makes no further distinction regarding the significance of values that exceed 0,7 making further interpretation difficult.

The column where the ranges have larger differences is limited to the ranges of corrected items and total correlation. Here the ranges are wider indicating larger differences between the lowest and the highest values in terms of the correlated values. The highest values for the three scales do not indicate major differences. The values for the four and six-point response scales are close, while the largest difference on the low score is for the five-point scale. The differences are attributed to the characteristics of the sample populations completing the CAI and the effects of using ordinal scales. The differences in the sample populations include:

- Data collected in different organisations that are not comparable in terms of core business;
- Home language of most of the respondents was not English;
- Qualifications of respondents varied;

- Ages of respondents varied.
- Effect of gender

Comparisons of the reliabilities of the respective scales indicate differences, but the overall differences are not significant. The lack of significant differences between the Alphas is attributed to differences in the sample populations that completed the CAI and the effects of using ordinal scales. The response format in the CAI was a combination ordinal scale with statements. Schepers (1992) reported that a combination of ordinal scale with statements affects responses.

Another possible factor could explain the results of the Alphas. Formula 4 (see page 38) requires a re-examination. This formula suggests when V_X is restricted (as in the case of the four-point scale) the obtained coefficient Alpha would increase. This may explain the slightly higher coefficient for the four-point scale. The fact that ordinal scales were used with all three-scale formats may be the reason for the relative small differences in overall reliabilities.

An inspection of the Alpha values, should the item be deleted, indicates values that are slightly lower than the Cronbach's Alpha values for each the respective scales. The Cronbach Alpha values are higher than the highest individual item Alpha values in the column. Nunnally and Bernstein (1994) characterise Cronbach's Alpha as the higher limit of the scale, and not the lower bound as reported by Cortina (1993).

These aspects will be discussed in more depth in Chapter 5.

4.6. Conclusion

The analysed results of the data of the four, five and six-point scales were reported in this chapter. The results of the item reliability statistics were reported for the respective response scales.

In the next chapter, chapter 5, the results and conclusion drawn from the literature survey and the empirical research are discussed.

Chapter 5

DISCUSSION AND RECOMMENDATIONS

5.1. Introduction

In the previous chapter, the results of the empirical part of the study were reported. A discussion of secondary objectives of the literature survey and empirical study form the emphasis of the present chapter. In preparation for the discussion, the setting of the problem, the motivation for the study, the research problem, the research objectives, the research design, the value of the research and an outline of the remaining chapters were outlined in chapter 1.

In chapter 2, literature relating to culture and the development of organisational culture instrumentation was provided. The review of the literature commenced with the concept culture, national culture and organisational culture. Models and theories were outlined and metrics of instrumentation described. An outline of the process relating to the design of instrumentation was presented.

In chapter 3, the research design and methodology was described. The Culture Assessment Instrument, the research process and the statistical procedures employed in the study were outlined.

In chapter 4, the results of the various statistical procedures were reported. The results of the descriptive statistics, and factor analysis were set out together with the respective findings.

In this chapter it will be pointed out how the objectives of the study, both theoretical as well as empirical, were achieved. The findings of the study will be discussed and conclusions drawn. Recommendations will be made based on the findings. The value and the limitations of the research will be pointed out and recommendations made for future research will be made.

5.2. Review of the study

In the review of the study the focus is on the literature survey and on the empirical study.

5.2.1. Literature survey

The primary of objective was to identify models and theories of organisational culture that would be useful in the design of organisational culture instruments and to identify aspects that need to be taken into consideration in the design of organisational culture instruments.

The secondary goals were to:

- Outline the concept culture from an anthropological, national and organisational perspectives.
- Describe models of organisational culture for the development of organisational culture instruments.
- Propose a model for corporate culture including the major domains of organisational culture.
- Describe the nature of measurement levels and the relationship to response scales.
- Outline the metrics required in instruments.
- Outline the features of a well-designed instrument.

5.2.2. The empirical study

The primary objective of the empirical study was to examine the feature of measurement scales and their relative usefulness in survey instruments. The focus was on three scales (four, five or six point scales) to provide the most reliable scale to assess organisational culture.

At the secondary level the objectives were to:

- Show the metric properties of a four-point response scale on an instrument.

- Show the metric properties of a five-point response scale on an instrument.
- Show the metric properties of six-point scales response on an instrument.

The results of the literature review as well as of the empirical study are provided in the sections that follow.

5.3. Results of the literature survey

Results on each of the secondary objectives are reported below.

5.3.1. The concept culture from anthropological, national and organisational perspectives

Culture as a concept has universal application. Concepts used in dictionaries bear a strong resemblance to concepts used in anthropological, national and organisational literature. Furthermore, the definitions emphasise the social aspects of culture.

In the anthropological literature, culture is described in terms that have strong correlates with terms found in the organisational literature. The classical work of Kroeber and Kluckhohn (1952) further illustrated the relationship between anthropology and organisational culture. In their work, concepts may be classified into categories of artefacts, beliefs and values and basic assumptions with comparative ease.

Beals and Hoijer (1971) emphasised the relationship between behaviour and culture. The linking of behaviour to culture allow for the identification of patterns of behaviour typical for a particular community. Conceptually, national culture represents a large community, in the same way, an organisation is a community. Patterns of behaviours should thus be observable and the elements similar to those identified by Kroeber and Kluckhohn (1952).

National cultures have their own distinguishing features that distinguish them from other cultures. Artefacts, beliefs, and values have their own unique manifestations.

Hofstede (2001) suggested a systems model to illustrate the dynamics of national culture. As has been suggested above, patterns emerge from the model as he indicates outcomes or consequences resulting from the inputs and values held by the majority of people at the national level.

Values and beliefs are common at the national level. Organisations wishing to do business across their borders need to take cognisance of the host country's culture. Segalla (2001) reported where there is an appreciation and an understanding of a host county's values, there is a greater likelihood of the organisation being successful when engaging in cross-border mergers, acquisitions, joint-venture and alliances. Project GLOBE has further highlighted the need for managers to have cultural acumen to be able to manage and do business in foreign countries (Javidan & House, 2001). Certain cultural characteristics of the establishing organisations could be accepted with local adaptations.

Interest in organisational culture remains high after 20 years. Organisational culture literature acknowledges the influence of anthropology (Kotter & Heskett, 1992). Interest has been expressed in organisational culture as organisations have access to available technology and they recognise the need to have performance compatible cultures to have high performing organisations (Kraut, 1996).

Culture has different areas of emphasis when considering the definitions:

- Cognitive: members are taught to think in certain ways as to what is acceptable and what is not;
- Affective: members are taught how to feel in relation to problems;
- Dynamics: members are move to action;
- Sharing of what is common: the underlying commonalties as to what is shared by all;
- Strategies: what works best in the organisation.

(Denison, 1990; Hatch,1997; Ott, 1989; Schein, 1985)

The characteristics mentioned above would be true in the various fields of organisational cultural study.

5.3.2. Models of organisational culture for the development of organisational culture instruments

Models and theories are useful when explaining phenomenon in organisations. Models focus on those areas that they aim to explain. In the development of instruments, models are critical to set parameters for instrument development. Martins (2002) proposed a three-tier approach to mapping organisational culture. The levels are integration, differentiation and fragmentation. Each of the levels have functional value for the practitioner. For the purpose of instrument development, integration of the levels of culture is the required. The level of integration assumes that all members in the organisation. at different levels of the organisation have shared meanings of the culture. The model also considers all manifestations of culture and therefor measures all levels of culture.

Askanasy et al. (2001) suggested a classification of measures. The measures are either typing or profiling of organisations. A profile would elicit information across a range of domains and elements. The profile would give a distinctive profile of the organisation. Profiling allows for measurement at all levels, while typing would allow measurement in limited areas only. Typing would limit information available to the practitioner. It is interesting to note that models that are amenable to the integrative model are also amenable to profiling.

Models selected in the literature have a common link. They are all integrative in their approach, they describe culture at different levels and they focus on the shared meaning of members.

Schein (1985) provided a structured model that explains different levels of culture ranging from the visible to the invisible level. He included the domain of artefacts, beliefs and values and underlying assumptions. The model indicates the levels that are in dynamic interaction with each other.

Denison (1990) suggested a model showing the relationship between the organisation an its internal and external environment. Four elements: adaptability; mission; involvement, and consistency are related to focus areas of change and

adaptability and stability and direction. It is the interaction and balance of these relationships that influence the organisational effectiveness. The organisation must then accommodate the internal and external environment while being adaptable by having a mission, being involved, and having consistency in its operations.

Hatch (1997) relied on the work of Schein (1985). Her focus is on the dynamic interactive elements of culture. The experience of organisational members of their organisational world and the interpretation of the symbols in the organisation, provide the "*substance*" of organisational culture. The idiosyncratic interpretations of organisational members occur within the social context of the organisation. It is the interpretations of organisational members, which contributes to the shared meanings members have.

5.3.3. A model of organisational culture including the major domains of organisational culture

Organisational culture models, to be useful in the development of instrument, should include those features that best describe organisation culture in an integrative manner and that allow for the profiling of an organisation.

The literature supports the notion of levels of culture a suggested by Schein (1985). Domains are included in Schein's (1985) model. Domains identified, included artefacts, beliefs and values and underlying assumptions. Each of the domains have elements that can be classified into the respective domains. The only domain, which provides challenges, is that of underlying assumptions. These elements may still be elicited and classified although there is little evidence in the literature.

Artefacts include those elements that are characterised by materials and patterns of behaviour (Schein, 1985; Ott, 1989). The elements are the more obvious manifestations of organisational culture. At this level are a variety of objects, symbols and patterns of behaviour that provided information that is communicated to the organisational members and to outsiders. Outsiders are able to make value judgements as to the attractiveness or performance of the organisation.

Values and beliefs are represented at the next level (Schein, 1985; Ott, 1989). Values and beliefs influence the choices and decisions made in the organisation. Organisational members share values. When organisations change, the values often do not change as required by management. In the transition period, there are the actual values and the new espoused values of the organisation. It is only when significant members of the organisation demonstrate and comply to new values that values start to change, organisational members then emulate and assimilate the behaviour. Values are pervasive and are reflected in the activities of the organisation (Schein, 1985; Ott, 1989).

Basic underlying assumptions operate at the highest level of the organisational culture continuum (Schein, 1985; Ott, 1989). The identification of underlying assumptions remains a challenge as the assumptions are at the unconscious level. Schein (1999) suggested that standard self-report instruments do not elicit underlying assumptions. He suggested that a more interactive, qualitative approach be followed utilising focus groups and appreciative inquiry methodologies. Cassel, Close, Duberley and Johnston (2000) suggest the use of repertory grid methodology to uncover embedded assumptions of organisational culture.

Time, as an organisational cultural variable, is important as it relates how patterns are enacted in the organisation in or over time. The achievement of outputs is most often not achieved in a linear manner. Activities are completed simultaneously and add to the level of complexity of behaviours in the organisation (Bluedorn, 2000; Jacques, 1989. Time horizons, and decision-making are linked and are reflected in the complexity of decisions made that impact on the future of the organisation (Jacques, 1989).

The model proposed (see Figure 2.1 p.27) includes the different levels of organisational culture including the elements that one would expect to find at the different levels. The model recognises the need for behavioural indicators that would be discernible in a distinctive profile of the organisation. The model requires that the profile be obtained for a particular purpose, that is that the culture measures should provided information relating the effectiveness of the organisation in the outcomes produced. Furthermore, time is recognised as an element in organisational culture.

The way time is construed, interpreted and utilised in the organisation provides information as to the quality of the responsiveness to environmental changes that could be critical for success and performance in an organisation. Measuring organisational culture is often a "snapshot" of the organisation, often not taking changes occurring, or the future into consideration (Ashkanasy et al. 2000; Beals & Hoijer, 1979; Bluedorn 2000; Christensen & Gordon, 1999; Denison, 1990; Flamholtz, 2001; Flamholtz & Aksehirli, 2000; Hofstede, 2001; Kaplan & Norton, 2001; Kotter & Heskett, 1992; Martin, 2002; Ott, 1989; Payne, 2000; Phillips, 1995; Rowlinson & Procter, 1999; Schein, 1985; Trice & Beyer, 1984; Wilson, 2001; Zwell, 2000).

The domains and their respective elements provide information for the development of items instruments. To obtain a focused instrument that takes all the levels into consideration, a literature survey complemented with information obtained from repertory grid methodology would provide quality data for item development (Cassell et al., 2000; Martins, 2002; Steward & Steward, 1990). This includes instruments that would not only be a diagnostics tool, but could be used as an intervention for change where elements of a new strategy are included in the items of an instrument. This increases the useful application of an instrument (Kraut, 1996).

5.3.4. The nature of measurement levels and the relationship to response scales

Levels of measurement have critical implications for the design of culture instruments (Nunnnally & Bernstesn, 1994; McIntire & Miller, 2000; Welman & Kruger, 2001). Controversies are well documented, but the issues are yet to be resolved. Some authors (Nunnally & Bernstein, 1994; Gregory, 1996) are sensitive to the issues, while there are significant numbers that do not appear to be sensitive or have an appreciation for the consequences of not choosing appropriate response scales for their instruments. In the context of culture instruments, there is a need to have culture instruments that provide the best metric properties to ensure that the best decisions are made in organisations.

The practice of organisational measurement requires measurement using nominal, ordinal and interval levels of measurement (Nunnally & Bernstein, 1994). The greater part of the instrument should be devoted to continuous level scales (Swart, Roodt & Schepers, 1999). In practice, most instruments make use of made of ordinal measures that limit the choice of statistical techniques that could be used (Gregory, 1996). Table 2.1 provided, gives guidance per level as to the basic operations, descriptions, what determines the levels of measurement, permissible statistics, applications of the response scales and what response scales scale apply at what level (Allen & Yen, 1979; Babbie & Mouton, 2001; Gregory, 1996; McDaniel & Gates, 2001; Nunnally & Bernstein, 1994; Welman & Kruger, 2001).

By the nature of culture instruments, ratio level of measurement provides little opportunity for measurement as it assumes an absolute zero in the measurement. Absolute zero measures in the social sciences are rare (Welman & Kruger, 2001).

The nature of the levels of measurement acknowledges the inherent difficulties in the measurement of traits and constructs that are not directly observable. The levels work to ensure that traits and constructs are measured as accurately as circumstances allow (Nunnally & Bernstein.1994).

A few response scales were outlined. Only those response scale formats are included that are relatively inexpensive to develop in terms of time, cost and effort. The semantic differential is a structured categorical scale anchored at either end of the scale. The response points are labelled. The labels of the response points suggest the ordinal measurement of the scale. No clear equal intervals are possible where word labels are attached. The interpretations of the word labels have different meanings for different people (Rubin & Babbie,1997).

The Likert scale is the most popular of the scales used in culture instruments. The response format is a statement to which the respondent answers on a five-point scale labeled scale(Rubin & Babbie, 1997). The labelling used most often is strongly disagree, disagree, neutral, agree and strongly agree. Because statements are used most often, an acquiescence response style is likeley to be detected (Schepers, 1992). Thoughtful responses are less likely to occur. Evidence as to the use of the

scale in certain circumstances are conflicting (Huck & Jacko, 1974; Dixon, Bobo & Stevick, 1984). Different results have been obtained on various samples. Samples with low levels of educational are likely to respond at the extremes of the scale when compared to respondents with higher levels of education. The lack of comparable samples does not allow direct conclusions to be drawn at this stage (Chang, 1997).

Intensity scales provided the advantage associated with interval or continuous scales. The suggested format is a seven-point response scale with numbered response points anchored at either end of the scale (Schepers, 1992). The scale has been used advantageously with a five-point scale (Smith, 1990). As indicated above, most scales are sensitive to populations that have low educational levels. The low levels of education need to be considered in the interpretation of scores in the South African population. The fact that there are low levels of education does not preclude the use of instruments (Harley et al., 1996; Schepers, 1992).

The visual analog scale is similar to the intensity scale, without the numbered response labels. The use of the response scale would be limited to sophisticated populations that would be able to deal with the ambiguity of not having reference points on the scale. For the most part, the analog scale is not suitable for general use in organisation culture instruments. The scale could be useful in some culture interventions on a small scale where the effectiveness of interventions is measured within a relative short time. The population would need to be sophisticated to deal with the ambiguity presented by the format of the scale (DeVillis, 1990).

Errors and bias occur when instruments are completed. The challenges associated in the South Africa population must be recognised inn the interpretation of results. As indicated above, the lack of education among a large part of the population requires results to be interpreted carefully and with a measure of flexibility (Harley, 1996). Varieties of response styles have been identified. No rational explanation is available as to the reason for the occurrence of the styles (Jackson & Messick, 1967). The styles are attributed to a realistic response, ambiguity, meaninglessness or the difficulty the respondents have with items (Brown 1983). Each of these categories are significant in the South African context. Given the problems in education at this point in time, and respondents completing instruments in a language other that their

home language and the apparent effects of low incomes, response style effects cannot be ignored (Mda, 2000; Harley et al., 1996).

Various response styles are reported with their particular characteristics. Response styles range from the halo effect to prestige bias (Guilford, 1954; Welman & Kruger, 2001). Statistics and data need to be considered when interpreting results. Skewed results are obtained from samples that are characterised by low education, low income and age (Greanleaf, 1992). Brown (1983) suggests some remedies to deal with the problem. The remedies include providing clear instructions and the completion of instruments under controlled conditions where respondent could ask for assistance. In most surveys, the numbers required to complete instruments and the logistics would make the completion of such a project almost impossible where time is important. The effect of completing instruments under controlled conditions increase the possibility of obtaining socially acceptable responses where respondents have doubts about the confidentiality of their responses.

The levels of measurement require a new focus in the field of organisational culture instrument design. By linking the appropriate measurement level to a continuous scale, practitioners are likeley to enhance the quality of the metrics in culture measurements (Babbie & Mouton, 2001; Gregory, 1996). The scales used by practitioners should aim to use continuous scales to ensure they have the widest range of metrics available for data analysis (Nunnally & Bernstein, 1994; Welman & Kruger, 2001).

Response styles remain a contentious issue in the analysis and interpretation of results. Response styles are expected in the broader South African population where the majority of respondents have low incomes and education (Harley et al., 1996; Mda, 2000).

5.3.5. The metrics of instruments

At the practical level, practitioners require instruments that produce results that are equitable, reliable and valid (Cross et al., 2002).

Reliability is concerned with consistency. A variety of factors influences the reliability of a scale. Brown (1983) has suggested ways to ensure reliability by the completion of instruments under controlled conditions. Various methods are outlined including the test-retest method, parallel form of reliability, spilt-half test and internal consistency of items. From a practical perspective, instrument designers must endeavour to obtain coefficients to each of the types mentioned. Of the measures outlined, Cronbach Alpha is regarded as the most robust measure of reliability. This is also the least that should be calculated in the initial phases of the piloting of instruments (Anatasi & Urbani, 1997; Gheselli et al., 1981; McIntire & Miller, 2000; Van der Post et al., 1997).

Validity is concerned with the extent to which the instrument measures what it is intended to measure. In the validation of instruments, some practitioners often misinterpret validation to be a single procedure done at a particular point in the development of an instrument. Anatasi (1986) suggested that validation is more of a process than an event. Cross et al. (2002) emphasised the need to follow a process in the development of instruments to ensure that they are not only sound, but equable to the respondents. If the design process initially reported earlier is accepted as the point of departure the process could be adapted as follows:

Organisational culture instrumentation development				
Step 1	Step 2	Step 3	Step 4	Step 5
Identify the construct - culture	Define organisational culture model.	Identify the sub-domains of culture.	Operationalise the sub-domains in behavioural terms.	Develop the item format taking care of technical details as indicated by Schepers, 1992 pp. 2-7.
VALIDATION AT EACH STEP IN THE DEVELOPMENT PROCESS				

Figure 5.1: Validation of the instrument design process

(Adapted from Anatasi, 1986; Schepers, 1992 Swart, Roodt & Schepers, 1999, Rust and Golombok, 2000)

Various validation procedures are described including predictive validity, concurrent and convergent validity, content validity, criterion-related validity, discriminant validly, factorial validity, face validity and construct validity. Of the procedures mentioned, the

most important procedure in the early stages of instrument design is construct validity. Factor analysis is used to establish the underlying factor structure of the instrument to determine construct validity (Allen & Yen 1979; Anatasi & Urbani, 1997; Hair et al., 1998; Gheselli et al., 1981; McIntire & Miller, 2000; Van der Post et al., 1997).

Reliability and validity are important considerations in the design of instruments. Reliability is not only a concern in the design of the instrument, but also in the administration of the instrument. Reliability is influenced by factors often not known or understood by the practitioner. One of the factors that could influence reliability is the response style of respondents (Brown, 1983; Seckrest & Jackson, 1967).

The validation of instruments should be considered at the various stages in the development process. Validation should be viewed as a process rather than an event (Anatasi, 1986).

Practitioners must have the metrics of instruments as their highest priority to ensure decisions made using the results of instruments that have a positive impact on the lives on those who would be affected by decisions made (Cross et al., 2002).

5.3.6. The features of a well-designed instrument

Well-designed instruments have a definite purpose, a clear description of the population for which they are intended and clear instruction for the completion of the questions (Fink, 1995a).

A design framework has been suggested for the design of instruments. The framework indicates steps in a logical process that should facilitate the design of instruments (Schepers, 1992; Swart, Roodt & Schepers, 1999).

In the design of the instrument, attention must be give to the wording of questions and the ordering of questions. The quality and nature of questions may also influence the metric properties of an instrument (Fink, 1995a; McDaniel & Gates, 2001; Rubin & Babbie, 1997).

Respondent friendly instruments improve the response rate. Ensuring the instrument is visually pleasing is achieved by spacing items as well as clear and simple instructions to complete the instrument. The overall impression should invite the respondent to complete the instrument rather than cause confusion or anxiety. Ideally, instruments should not exceed 150 items, excluding the biographical data. However, in the South African population, the recommended that the number of items should be kept below the 130 question mark (Fife-Schaw, 2000; Jones & Bearley, 1995; Rubin & Babbie, 1997).

Questions should be ordered from the familiar, less sensitive to the less familiar more sensitive questions. Instruments not taking this precaution are likely to have incomplete data. In the South African context, some questions often asked in biographical data are regarded by some as offensive and therefor not answered. The most obvious examples are that of asking questions relating to gender, home language and race. The reasons for this phenomenon relate to sensitivities associated with personal rights and privacy. Biographical data should be placed at the end of instruments, as respondents are more likely to complete that information than when respondents are confronted with the questions at the beginning of an instrument (McDaniel & Gates; Mda & Mothotata, 2000).

The design of instruments is a logical process that have a purpose. The wording and ordering of questions have implications for the response styles and metrics of instruments. Sensitive questions should be placed at the end of instruments. What constitutes a sensitive word or issue may not be that clear to the practitioner, and it is recommended that sensitive questions be identified in the piloting process before the instrument is applied to the broader sample (McClendon & O'Brein, 1988; McDaniel & Gates, 2001; Rust & Golombok, 1999).

The empirical finding will be discussed next.

5.4. Empirical findings

The empirical findings are discussed according to the secondary objectives in more detail.

5.4.1. The metric properties of the four-point response scale

5.4.1.1. Validity

At the first level of analysis, seven factors emerged on the four-point response scale. Single descriptive labels could not be assigned to any of the first level factors on any of scales due to the possible creation of artefactors (Schepers, 1992). Second level analyses were conducted and a single factor emerged on the four-point scale. Factor loadings from the first level analysis indicate evidence that there are significant loadings that represents the construct culture.

5.4.1.2. Reliability

A Cronbach Alpha 0,9345 was calculated. The Alpha values if an item is deleted are of the order of 0,93 for all the items. Cortina (1993) indicated that a Cronbach Alpha of 0,7 and more is significant.

5.4.2. The metric properties of a the five-point response scale

5.4.2.1. Validity

At the first level of analysis, six factors emerged on the five-point response scale. Single descriptive labels could not be assigned to any of the first level factors on any of scales due to the possible creation of artefactors (Schepers, 1992). Second level analyses were conducted and a single factor emerged on the five-point scale. Factor loadings from the first level analysis indicate evidence that there are significant loadings that represents the construct culture.

5.4.2.2. Reliability

A Cronbach Alpha 0,9248 was calculated. The Alpha values if an item is deleted are of the order of 0,92 for all the items. Cortina (1993) indicated that a Cronbach Alpha of 0,7 and more is significant.

5.4.3. The metric properties of the six-point response scale

5.4.3.1. Validity

At the first level of analysis, six factors emerged. The numbers of items loading on each of the factors is highest for factor one and less for the remaining factors. A single descriptive label could not be assigned to any of the first level factors, owing to the possible creation of artefactors (Schepers, 1992). A second level factor analysis was done and two second level factors emerged. However, a forced single factor solution was calculated. From the descriptions of the first level factors, there is evidence that there are significant loadings on this single factor, which represents the construct culture.

5.4.3.2. Reliability

A Cronbach Alpha 0, 9273 was calculated. The Alpha values if an item is deleted are of the order of 0,92 for all the items. Cortina (1993) indicates that a Cronbach Alpha of 0,7 and more is significant.

From the results reported the reliability coefficient calculated using Cronbach's Alpha coefficients are as follows for the three response scales

An analysis of Table 4.30 fails to indicate significant differences between the Alphas on the respective response scales. The lacks of differences are partly attributed to the characteristics of the participating samples. Other contributing factors include the response format used, as well as the mechanics of the formula as described in form chapter 4.

In chapter one, three postulates were indicated. The reliabilities will be related to the respective postulates.

Postulate 1: Four-point response scales would yield the poorest metric properties, compared to the five and six-point scales.

The Cronbach Alpha for the four-point scale is the highest of the three sets of results. Statistics

It is useful to consider the Cronbach's formula (Formula 4) at this point. When substituting values in the formula, the variance of the scores would be 4. Therefor dividing the variance into the scores by the variance on all the test scores, the result would result in a higher coefficient. Table 4.30 indicates a higher coefficient for the four-point response scale when compared to the reliability coefficients for the five and six-point scales. Thus postulate 1 is rejected. The value of the four-point scale, given the manner in which the calculation is executed, does not indicate a true refection of Alpha.

Postulate 2: Six point response scales would yield the best metric properties, compared to the four and five-point scales.

The coefficient Alpha of the six-point scale is lower than the coefficient of the five and four-point response scale. Thus, postulate 2 is rejected.

Postulate 3: Five point response scales would yield better metric properties that the four-point response scale, but worse that the six-point response scale.

The Alpha value of the five-point scale is less than the value for the four-point scale and worse than the value for the six-point scale. Thus, postulate 3 is rejected.

5.5. Discussion of the empirical results

None of the postulates have been confirmed. The reliability for the respective scales, while having different values, is not statistically significant. The lack of conclusive evidence is attributed to the following factors:

5.5.1. Respondents

Characteristics of the responds will be highlighted in this section.

5.5.1.1. Language

The instrument is designed in English. The majority of respondents have indicated that their first language is not English. Where items are not clear or ambiguous, respondents are likely to respond in the affirmative and possibly provides another reason for the skewness of the responses.

5.5.1.2. Educational level

Standard biographical data is not available for all the response scales. In the six-point response format there were a significant number of respondent that have lower levels of qualifications. Low levels of qualified respondents are likely to respond at the either extreme ends of response scales.

5.5.2. Instrument

The characteristics of the instrument will be discussed next.

5.5.2.1. Content of items

The items included in the instrument do not indicate any unusual practice in business. Most businesses engage in the practices reflected in the items. The nature of the items would be typical practice in most organisations, hence the affirmative

responses by the respondents. Items used were common to all three response scales.

5.5.2.2. Response scale format

In the design of items employ statement-type items on a five-point, Likert type scale. Schepers (1992) indicates that there is a high likelihood for respondents to engage in acquiescence bias where items are of the statement type items in the Likert type format.

5.5.3. Levels of research

James (1982) and Glick (1985) argue that when doing organisational research that requires respondents respond to perceptions, respondents respond in terms of their opinion and perceptions. The perceptions are related to ambiguity, autonomy, influence, facilitation, support and warmth (James, 1982). There exists the possibility that the two levels of research results exist. At the one level is the organisation, while at another level, is the respondent's psychological level. Thus creating two units of measurement (James, 1982; & Glick, 1985). Glick (1985) further argues that the literature makes a distinction between organisational and psychological concepts. The levels should therefor be treated as different levels of measures in organisational research. Organisational culture includes a variety of psychological variables. The present study may have run into this dilemma of mixing the psychological with the organisational units of measurement.

5.5.4. Aggregation effect

Within each of the organisation, large differences existed in terms of the characteristics of respondents. Some organisations by the nature of their business (for example consulting or information technology) have high levels of education, while others (mining) have large groups of respondents with low levels of education. The combination of different organisations into one large sample had the effect of reducing or eliminating those differences.

Bliese (2000) refers to the issue of reliability with groups. He asserts that it is possible to have high reliability where agreement is low. If a respondent A consistently chooses 1, 2 or 3 on a five-point scale while respondent B chooses 3,4 or 5 on a five-point scale. Agreement will be low as a rating of 3 is different from a rating of 5, but reliability will be high because the responses are proportionately consistent for the respective respondents. Individual characteristics thus pay an important role in the interpretation or reliability coefficients

The comparison of the respective scales would only be meaningful once organisation level units and psychological level units are clearly defined and accommodated in the research design.

5.6. Recommendations

Recommendations are made from methodological, theoretical and practical perspectives.

5.6.1. Recommendations in terms of methodology

It is recommended that the Culture Assessment Instrument be redesigned to:

- Accommodate the three levels of the organisational culture.
- Develop items using a question rather than a statement format.
- Include more items that would contribute to the profile the instrument would provide and the overall reliability of the scale.
- Have standard biographical data for all the respondents that includes data that relates to age, race, qualification, language, gender, income and level in the organisation hierarchy. Data should be interpreted at the individual level and then at the organisational level to ensure information and the interpretation of that information is useful in terms of implementation efforts.
- Surveys often take the form of self-administered instruments. Practitioners need to have methodologies that are more inclusive. Many organisational members are not able to participate in self-administered instruments due to their lack of literacy

skills. Where people are involved they are more likely to contribute positively to an organisation's performance, than when they are not included.

- Obtain comparable data, the CAI should be administered to samples within organisations from the same industry so that samples can be compared both the organisational and at individual levels.

5.6.2. Recommendations in terms of theory

- Organisational culture theory lacks a single integrated model that includes the levels of culture, the domains of culture, the culture dynamics, time and organisational performance components. It is recommended that a single model be developed that would provide parameters needed to elicit information that would be useful in organisational change efforts.
- The South African population presents many challenges in terms of obtaining useful information. Significant numbers of organisational members are excluded from surveys due to the lack of literacy skills. Many who do have basic literacy skills still have disadvantages when completing instruments. Response sets and styles together with questions have been outlined. In the South African context the effects of the variables mentioned in Chapter 2 require urgent investigation to ascertain the magnitude of the effect of those variables. Understanding specific areas will facilitate the interpretation of the data to make meaningful decisions as organisations strive to become and maintain their competitiveness and performance.

5.6.3. Recommendations in terms of practice

- It is recommended that the Culture Assessment Instrument be adapted to reflect the considerations provided in the section on instrument design. In the format used, the number of items was limited to 38 items. To justify the effort, more items need to be developed that would measures at the less obvious levels of organisational culture. The instrument should then be used where organisations are comparable in terms of core business, and sample characteristics. Where

many of the extraneous variables are controlled, the possibility exists to make meaningful comparisons of the respective scales.

- More inclusive methodologies to measure organisational culture should be developed that are inclusive, deliver reliable and valid data in a time and cost effective manner. At a time when the Internet is being used to gather data, more organisational members are not included in the surveys.
- Instruments should be developed using questions and intensity response scale formats. This format is likely to control biased responses and improve the metric properties of the instrument.

5.7. Estimated value of the study

The estimated value of the study is presented in terms of the estimated contribution made from the methodological, practical and theoretical perspectives.

5.7.1. Estimated methodological contribution

The estimated methodological contribution of the study include:

- The development of a process for the development of organisational culture instruments.
- The development of a process for the validation of culture instruments.
- Guidelines for the development of questions for culture instruments.
- Guidelines for the layout of culture instruments.
- Guidelines for the choice of response scales.
- Introduction of the analog scale which could be useful in the evaluation of interventions.

5.7.2. Estimated practical contribution

The estimated practical contribution of the study includes:

- Guidelines have been provided for the development of organisational culture instrument design.

- Guidelines have been provided for the development of questions.
- Guidelines are provided for user-friendly instrument design.
- Indicating the sensitivity of metrics to variables when using secondary data.
- Integrated view of the uses and application of the levels of measurement, types of scales and possible statistics that may be used with particular levels of measurement.
- The sensitisation of practitioners of the challenges of interpretation of data associated with response styles.

5.7.3. Estimated theoretical contribution

The estimated theoretical contribution of the study includes:

- The development of an integrated model or organisational culture.
- The highlighting of parameters that require attention in the choice of models when developing organisational culture instruments.
- Indicating the need to interpret metrics of instruments in terms of the components of formulas.
- The suggestion of repertory grid methodology to elicit underlying assumptions in the development of items for culture instruments.

5.8. Limitations of this research

The following limitations need to be considered in this study:

- The use of secondary data does not allow the results to be generalised to a larger population.
- The effects of organisation, age, education, language, race and income levels were not considered in the data analysis which may have allowed for more comparable data to be extracted.
- The lack of standard biographical data across all the scales did not allow for comparisons to be made or for comparisons within the samples of the respective response scales.

- The results were based on an instrument of only 38 items that measure organisational culture at a superficial level. A more robust measure of organisational culture may have produced more significant results.

5.9. Future research

Emanating from this study, the following research is suggested:

- The investigation of the true effects of response formats (that is four, five and six-point response formats) using similar samples and organisations should be used.
- Investigating the wording effects on response scales.
- Establish which questions are likely to be regarded as sensitive or offensive for South African population and to suggest alternative methods of obtaining similar data while obtaining optimum response rates.
- Establish the effects of changes in wording on response scales, positive to negative and negative to positive and the relationship to response styles.
- Specific effects of age, education language income, gender and race in response sets and styles.
- The effects of asking biographical data at the beginning or end of a questionnaire on response rates.
- The effect of sensitive questions and how these could be managed and be allowed for in instrument design.
- The influence of time or temporal effects in the development of culture.
- The effect of changing the response positions i.e., changing the don't know from the middle positions to the end of the response options where Likert type response scale are required.
- The effects of computer aided instruments and responses to sensitive questions.
- To research the racial differences, the effects of socio-economic and educational levels of respondents in relation to response bias.
- What the effect would be on the metrics of instruments be in re-designing the response scale in the intensity scale and question format.
- Evaluate the Culture Assessment Instrument the different response scales using data from similar organisations with comparable sample.

5.10. Conclusion

The study of the effect of response scales in the South African context requires more attention to population variables. The effects of instrument design are critical in obtaining useful and credible information for making decisions relation to organisational culture.

The finding of the study highlights and emphasises the need for careful instrument design to obtain good metrics from instruments. Research completed in the past years has apparently not found its way into organisational culture instrument design. This study provides some guidelines as to how practice may be improved to the benefit of organisations and those included in surveys.

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Annexure A

THE ORGANISATIONAL CULTURE INSTRUMENT

Instructions

Thank you for your willingness to complete the questionnaire. Your answers will be completely confidential. Please answer each question as honestly as possible, because only then can we address the real problems.

The questions starts with section A, which consists of a few problems on biographical information, such as years service and qualifications. This personal information will enable us to take action to solve problems. In section B we require information on how you feel about organisational culture in (……..name of organisation).

A. Survey period

	May 1998
	May 1999

Please answer all the questions.

Thank you for your co-operation!

YEARS SERVICE IN THE ORGANISATION

	Less than 1 year
	Between 1 and 4 years
	Between 4 and 10 years
	Between 10 and 15 years
	More that 15 years

PLEASE INDICATE YOUR HIGHEST QUALIFICATIONS

	Std 9 and lower
	Std 10, Matric or equivalent
	Post matric qualification
	Technikon Diploma, University degree or other professional qualification.

IN WHICH DEPARTMENT DO YOU WORK

	Administration / Human Resources
	IT
	Finance
	Buying / advertising

SECTION B – QUESTIONNAIRE

Instructions

This section consists of 79 questions about the culture of (……..…… Organisation's name). Decide if you agree or disagree with each statement and mark you answer on the scale shown below:

For example: ……"It is important that I give my honest opinion."

If you strongly agree with the statement, cross the number 5, i.e. "STRONGLY AGREE".

Differ Strongly	Differ	Uncertain	Agree	Agree strongly
				X

Section B

		Differ Strongly	Differ	Uncertain	Agree	Agree Strongly
1.	I fully understand the mission of the organisation.	1	2	3	4	5
2.	I understand the overall objectives of the organisation.	1	2	3	4	5
3	Each department/ function and employees in possession of measurable standards which specify the results to be achieved.	1	2	3	4	5
4.	Employees are given the opportunity to make a contribution in identifying the outputs fir their own group / department.	1	2	3	4	5
5.	Written plans for our work group / department are available for at least 12 months.	1	2	3	4	5
6.	Performance feedback sessions are held with employees weekly/monthly to evaluate their performance against predetermined objectives/standards.	1	2	3	4	5
7.	I know precisely who our target market and clients are.	1	2	3	4	5
8.	We spare no efforts in understanding the needs of our internal and external clients/customers.	1	2	3	4	5
9.	I am of the opinion that our products/clients services	1	2	3	4	5
10.	I am of the opinion that our products and services / client services cannot be improved substantially	1	2	3	4	5
11.	The organisation takes a purposeful action to integrate its core values with all activities and results	1	2	3	4	5
12.	Our employee display professional image in their contact with the public, their relationships with colleagues and their general behaviour a work	1	2	3	4	5
13.	Employees respect the property and the possessions of the organisation … they protect them and do not take anything belonging to the organisation.	1	2	3	4	5
14.	Employees display an attitude of doing things right the fists time.	1	2	3	4	5
15.	We provide our products / services totally free from any discrimination (race or gender).	1	2	3	4	5
16.	I am satisfied with our organisation's involvement in the community (community involvement includes development of the environment, nature conservation, sponsoring sport and cultural activities and upliftment of the underprivileged.	1	2	3	4	5
17.	Involvement in the community is not purely for the organisation's own benefit.	1	2	3	4	5

18.	We are serious about social responsibility… respect for the environment is clearly visible in our activities.	1	2	3	4	5
19.	We are satisfied with the technology, equipment, job tools and other physical things we need to do our work.	1	2	3	4	5
20.	The physical experience of the buildings, offices, equipment, furniture and reception areas support the organisation's image.	1	2	3	4	5
21.	The way we dress supports the organisation's image.	1	2	3	4	5
22.	Our organisation has an induction programme to coach new employees in the required cultural values and norms.	1	2	3	4	5
23.	Equal opportunities for all people in our organisation has become a reality.	1	2	3	4	5
24.	The needs of human resources are determined scientifically.	1	2	3	4	5
25.	Recruitment takes place without discrimination in terms of gender, rave or gender.	1	2	3	4	5
26.	In order to adjust to the rapidly changing political situation in South Africa it is desirable to appoint people of colour at all levels of authority in our organisation.	1	2	3	4	5
27.	This organisation is sought after in the employment market.	1	2	3	4	5
28.	We retain our best workers.	1	2	3	4	5
29.	Internal training is competency based (i.e. Employees are able to perform the tasks successfully after training.	1	2	3	4	5
30.	Action is taken to develop supervisors and managers as both managers and leaders.	1	2	3	4	5
31.	Performance evaluation is succeeded with development interviews during which training and development actions are jointly planned with employees.	1	2	3	4	5
32.	Resignation interviews are conducted with all employees who have resigned, to identify the real causes for resignations/labour turnover.	1	2	3	4	5
33.	The organisation responds quickly to changes in the internal and external environment.	1	2	3	4	5
34.	The organisation is managed effectively.	1	2	3	4	5
35.	There is no resistance to change in this organisation.	1	2	3	4	5
36.	The minimum organisational levels exist.	1	2	3	4	5
37.	The minimum duplication of work occurs.	1	2	3	4	5
38.	We are all clear on our roles in the organisation.	1	2	3	4	5
39.	The organisation structures do not change too rapidly.	1	2	3	4	5

40.	A visible trust relationship exist between employees and management.	1	2	3	4	5
41.	Work is equally distributed amongst employees – some are not overloaded while others are under-utilised.	1	2	3	4	5
42.	Support services render professional work…they are respected for the value they create for their internal customers.	1	2	3	4	5
43.	Communication in our company is effective.	1	2	3	4	5
44.	Employees are adequately informed about what other departments are doing.	1	2	3	4	5
45.	There are sufficient personal discussion ("eyeball session") on matters of significance between managers and employees.	1	2	3	4	5
46.	Higher level management takes purposeful action to make contact with employees on the lower levels.	1	2	3	4	5
47.	Subordinates have an open channel of communication to higher levels of authority.	1	2	3	4	5
48.	The system is not overloaded with unnecessary paperwork like report, forms and memo's.	1	2	3	4	5
49.	Purposeful action is taken to delegate decision-making to appropriate lower levels.	1	2	3	4	5
50.	My work environment could be described as participative.	1	2	3	4	5
51.	When decisions are made at higher levels, those affected most by the decisions are consulted.	1	2	3	4	5
52.	Hen an employee makes a mistake, such a mistake is not held against him/her for a long time.	1	2	3	4	5
53.	Employees and managers collectively formulate objectives.	1	2	3	4	5
54.	The achievement of goals is considered as important, therefore time is spend on implementation.	1	2	3	4	5
55.	My work results are determined accurately.	1	2	3	4	5
56.	Self control is promoted in this organisation.	1	2	3	4	5
57.	Timeous and accurate control information enables employees to act proactively rather than reactively.	1	2	3	4	5
58.	In our organisation those persons in positions of authority delegate as much power as required to complete tasks successfully.	1	2	3	4	5
59.	I believe that my own personal objectives can be satisfied through the achievement of organisational objectives.	1	2	3	4	5
60.	The organisation cares for its employees.	1	2	3	4	5
61.	I don't mind "walking the extra mile" when necessary.	1	2	3	4	5

62.	Career planning is done for all employees.	1	2	3	4	5
63.	Performance / achievement is evaluated objectively according to actual results.	1	2	3	4	5
64.	Our remuneration systems (salary, fringe befits etc.)	1	2	3	4	5
65.	A relaxed yet dynamic atmosphere exist in our organisation.	1	2	3	4	5
66.	The organisation is known for its innovative products and or services.	1	2	3	4	5
67.	Employees are continuously encourages to develop better work procedures and methods.	1	2	3	4	5
68.	Rules and regulations are continuously reviewed and upgraded to cope with change.	1	2	3	4	5
69.	In our organisations, there is an unconditional acceptance of subordinates as human beings.	1	2	3	4	5
70.	Management believes subordinates are self-motivated and have the ability to control their own work.	1	2	3	4	5
71.	Teamwork is an important characteristics of our organisation.	1	2	3	4	5
72.	The activities of the various sections within the organisation are co-ordinated and aligned.	1	2	3	4	5
73.	Conflict between departments/functions in out organisation does not cause waste of resources.	1	2	3	4	5
74.	We solve our differences… we get to the root of out differences.	1	2	3	4	5
75.	Conflict is resolved by confronting those involved in the problem and mutually working towards solutions.	1	2	3	4	5
76.	Support services understand the needs of internal clients.	1	2	3	4	5
77.	The service rendered by support services is a balance between co-ordination and direction.	1	2	3	4	5
78.	I believe that our management has the vision and knowledge to lead the organisation successfully through the nineties.	1	2	3	4	5
79.	Managers in our organisation have the necessary leadership skills.	1	2	3	4	5

Thank you for your co-operation!