THE DISCRIMINANT VALIDITY OF THE CULTURE ASSESSMENT INSTRUMENT: A COMPARISON OF COMPANY CULTURES

WILLIE DU TOIT
GERT ROODT
Department of Human Resource Management
Rand Afrikaans University

ABSTRACT

The aim of this study was to assess the discriminant validity of the Culture Assessment Instrument (CAI); that is to distinguish between mean culture scores of different companies. The convenience sample consisted of 4066 respondents from five different companies, originating from various industries. CAI scores of 56 items were factor analysed on two levels, followed by iterative item analyses. Significant differences between company mean scores were identified, but only a small portion of the variance in these scores could be ascribed to culture differences. Based on these findings, it was concluded that the CAI in its current form does not possess discriminant validity. It is recommended that items attuned to deeper levels of culture, based on Schein's three-level typology, be added to the instrument.

OPSOMMING

Die doel van die studie was om die diskriminante geldigheid van die 'Culture Assessment Instrument' (CAI) te beoordeel; dit is om tussen gemiddelde kultuurtellings van verskillende ondernemings te onderskei. Die geleentheidsteekproef het bestaan uit 4066 respondente uit vyf verskillende ondernemings afkomstig uit verskeie industrieë. CAI-tellings van 56 items is op twee vlakke gefaktoranaliseer, gevolg deur iteratiewe itemontledings. Beduidende verskille tussen ondernemings se gemiddelde kultuurtellings is gevind, maar slegs 'n klein proporsie van die variansie in die tellings kon aan kultuurverskille toegeskryf word. Gebaseer op hierdie bevindinge, is daar tot die slotsom gekom dat die CAI in sy huidige vorm nie oor diskriminante geldigheid beskik nie. Daar is aanbeveel dat items gerig op dieper kultuurvlakke, gebaseer op Schein se drievlaktipologie, tot die instrument gevoeg word.

ORGANISATIONAL CULTURE

A review of the literature revealed that the construct "organisational culture" remains one of the most contested areas of academic inquiry within the broader field of organisational studies. It is characterised by competing definitions, epistemologies and research paradigms. Controversies exist about virtually all aspects of this construct including the mechanics and extend of its contribution to organisational performance (Erwee, Lynch, Millett, Smith & Roodt, 2001).

According to Ajiferuke and Boddewyn's (1970, p.154) "*there are almost as many meanings of culture as people using the term*". Kroeber and Kluckhohn (1952) already suggested in 1952 that there were as many as 164 meanings of the term "*culture*". Since then it was hoped that the field may have been further refined and a more "common" definition may have been agreed upon. Instead, what culture is and the nature of it are still hotly contested (Bolman & Deal, 1991).

Fortunately, some areas of overlap can be discerned. Most basic is that there seems to be general agreement that organisational cultures are based in sets of meanings shared by some groups of people. This focus on what is shared has been neglected by other constructs used to study organisations and thus gives the culture construct a useful distinctiveness for organisational research (Beyer, Hannah & Milton, 2000).

The Culture Assessment Instrument (Martins, 1989) represents one line of inquiry in the field of organisational culture. Martins (1989, p. 45) defines organisational culture as follows:

"Organisational culture is an integrated pattern of human behaviour, which is unique to a particular organisation and which originated as a result of the organisation's survival processes and interaction with its environment. Culture directs the organisation to goal attainment. Newly appointed employees must be taught what is regarded as the correct way of behaving."

This definition of culture conforms to Green's (1989) notion of culture as the organisation's equivalent of the individual's personality. Culture provides an underlying pattern to the behaviour of organisations, just as personality provides an underlying pattern to the behaviour of the individual.

Fundamental to the development of the CAI is the belief that organisational culture can be defined in terms of a set of uniform dimensions or characteristics. This approach falls firmly within the positivistic approach of culture (Denison, 1996). Within this perspective the central aim is the development of a set of dimensions across which culture could be compared (Denison, 1996) and measured and hence more effectively managed (Erwee et al., 2001).

Groeschl and Doherty (2000) pointed out that culture consists of several elements of which some are implicit and others are explicit. Schein (1985) identified three levels of culture, i.e. artefacts, values and assumptions (See Figure 1). Insight into these levels are fundamental to understanding the culture of organisations.
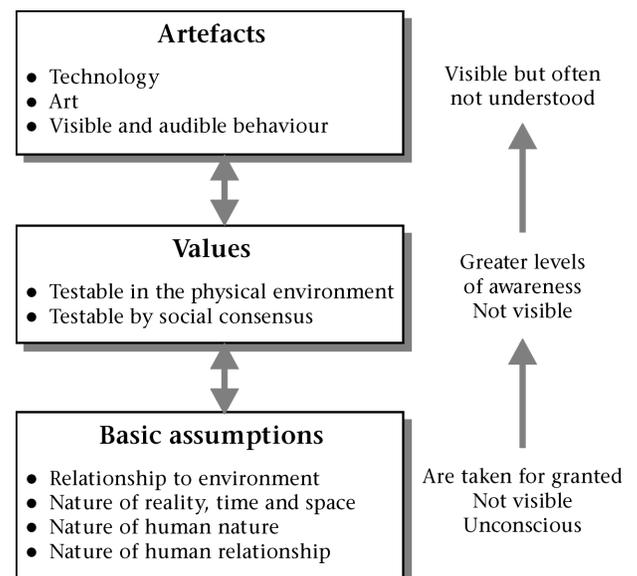

Figure 1: Schein's Levels of Culture
Adapted from Schein (1985, p.14)

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. Values represent the principles and standards valued by organisational members. Values are the foundation as to what is acceptable and what is not acceptable. Assumptions and beliefs 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. Assumptions are the basis for how organisational members think and feel. Assumptions are unconscious and are taken for granted (Schein, 1985).

To fully understand the complexity of the organisational culture literature, it is necessary to note the various perspectives of culture (Wilson, 2001).

Perspectives of Organisational Culture

Martin and Meyerson (1988) identified three major perspectives in organisational culture research, i.e. the integration perspective; the differentiation perspective, and the fragmentation perspective.

The integration perspective portrays a strong or desirable culture as one where there is organisation-wide consensus and consistency. Espoused values are consistent with formal practices, which are consistent with informal beliefs, norms and attitudes. Cultural members share the same values, promoting a shared sense of loyalty and commitment. Where inconsistencies, conflict or subcultural differentiation occur, this is portrayed as being a weak or negative culture.

The differentiation perspective emphasises that rather than consensus being organisation-wide, it only occurs within the boundaries of a subculture. At the organisational level, differentiated subcultures may co-exist in harmony, conflict or indifference to each other. Van Maanen (1991), in his study of an organisation, found groups of employees who considered themselves as being distinct. These sub-cultures related to different jobs, different levels of organisational status, gender and class. Claims of harmony from management masked a range of inconsistencies and group antagonisms. What is unique about a given organisation's culture, then, is the particular mix of subcultural differences within an organisation's boundaries.

The fragmentation perspective views ambiguity as the norm, with consensus and dissension co-existing in a constantly fluctuating pattern influenced by events and specific areas of decision making. As stated by Frost, Moore, Louis, Lundberg, and Martin (1991), consensus fails to coalesce on an organisation-wide or subcultural basis, except in transient, issue-specific ways. Rather than the clear unity of the integration perspective, or the clear conflicts of the differentiation viewpoint, fragmentation focuses on that which is unclear.

Many of the studies in organisational culture focus on only one of these perspectives, arguing whether it and it alone is evident within the organisation. Martin and Meyerson (1988) argued that any culture contains elements that can be understood only when all three perspectives are used. Therefore, within a company there may be organisation-wide consensus on some issues, consensus only within certain subcultures on other issues and an ambiguous state on the remainder. Schein, in Frost *et al*. (1991), suggested that there may be a core set of ideological guidelines within an organisation that require a minimal consensus and consistency, otherwise organisations would not function. Therefore consistency, consensus, harmony and integration may occur, but within the midst of inconsistencies, ambiguities, conflicts, disruption and dissolution.

Noting the complexities associated with the different perspectives described above, this study is carried out from the integration perspective, where cultural members share the same values, promoting a shared sense of loyalty and commitment.

Measuring Organisational Culture

Although the concept of organisational culture has been prominent in organisational and management literature since the 1970s (Barley, Meyer, & Gash, 1988), scholars still disagree on the best way to measure it (see O'Reilly, Chatman, & Caldwell, 1991; Rousseau, 1990). Some authors have suggested the use of multiple methods (e.g., Martin, 1992; Rousseau, 1990), but these methods are often complex, expensive, and time-consuming (Ashkanasy, Broadfoot & Falkus, 2000). Following are examples of different ways of measuring organisational culture.

Reynierse and Harker (1986) used a combination of quantitative and qualitative measures to measure culture. The qualitative methods involve interviews and group discussions, while the quantitative method, which they call organisational dynamics, is a survey questionnaire using 95 items on a five-point ordinal scale of definite agreement to definite disagreement. The method aims to provide managers with tangible feedback in managing culture, their "fundamental proposition" being "that you can't manage organisational culture unless you can measure it" (Reynierse & Harker, 1986, p. 1).

Reynolds (1986) used a questionnaire to measure culture differences between organisations to see if the measured differences relate to differences in performance.

Barnett (1988) outlined details of what he calls a "Galileo tm" or "Galileo analysis" for measuring culture accurately. Some of the methods are common to those used in qualitative approaches, but Barnett quantifies the results. It is considered that the method is too narrow, using only language, symbols and concepts as measurable elements.

Wiener (1988) measured "central value systems" and believes that by measuring the intensity and breadth of key values, one can measure culture.

Nossiter and Biberman (1990, p.13) used a technique for studying and diagnosing culture they call "projective drawing and metaphorical analogy fantasising", where questionnaires ask participants to draw an image and name an animal representing their organisation and department. They believe that the creativity involved may motivate employees to think more about their organisations.

Tucker, McCoy, and Evans (1990) designed a comprehensive questionnaire, developed from interviews and discussions with 50 managers of organisations. They believe results from the questionnaire, which are quantified, will help provide some preliminary information on the organisation's culture to managers attempting to deal with particular situations and problems with their cultures.

Gabriel (1991) saw stories as the basis for the myths that act as coping mechanisms for individuals in organisations.

Most of these techniques are as yet too recent for much empirical testing to have been carried out on them.

A Case for Quantitative Measurement

Among authors who suggest some use of quantitative measures are Amsa (1986), Barnett (1988), Bookbinder (1984), Cooke and Rousseau (1988), Desatnick (1986), Hofstede (1986), Reynierse (1986), Reynierse and Harker (1986), Reynolds (1986) and Wiener (1988).

Scholars such as Martin (1992) noted that quantitative assessment of organisational culture has been criticised in the past because of a strong mono-method bias in the field. Although Martin argues for a need to include qualitative data in culture studies,

the essence of her case is that there is a need for a multilevel and multi-method conceptualisation. In this respect, Schein's (1985) three level typology provided a distinctive role for both quantitative and qualitative measurement.

As the elements of culture become more conscious and observable to participants in a study, they become more accessible to standardised assessment (Rousseau, 1990). For example, it is generally agreed that surveys represent an efficient and standardised means of tapping the shallower levels of Schein's typology. The deepest level of culture, on the other hand, can be investigated only through more intensive observation, focused interviews, and the involvement of organisational members in self-analysis (Ott, 1989; Rousseau, 1990; Schein, 1990). The thrust of this argument is that there is a clear and continuing role for quantitative measures as a means of assessing the less abstract levels of organisational culture.

All quantitative measures of culture are likely to suffer from the same limitations, with the main weakness being that basic assumptions are often non-debatable and unconscious. People's written or oral answers to questions are not necessarily indicative of their basic assumptions.

The usefulness of quantitative measurement may not be restricted to the shallower grounds for maintaining that the three levels of culture are unified especially when a culture is strong. In this case, quantitative measurement of organisational culture may have the potential to tap deeper levels of culture (Ott, 1989; Rentsch, 1990).

Ashkanasy *et al.* (2000a) noted that survey methods have characteristics that render them especially useful for organisational culture research. Self-report surveys allow respondents to record their own perceptions of reality. Because behaviour and attitudes are determined not by objective reality but by actors' perceptions of reality (Rentsch, 1990), it is clearly appropriate to focus on perceptions rather than on reality. Further, self-report measures offer internal credibility to organisational members, which is likely to increase the likelihood that members will accept the results of the survey.

Researchers have cited numerous other advantages of survey assessment and of quantitative techniques generally. These include allowing replication and cross-sectional comparative studies, providing an accepted frame of reference for interpreting data, helping the evaluation and initiation of culture change efforts in organisations, and providing data that can be analysed through multivariate statistical techniques (Cooke & Rousseau, 1988; Xenikou & Furnham, 1996).

In summary, what is borne out by the literature, is that questionnaires can play an important role in the quantitative analysis of organisational culture (Reichers & Schneider, 1990)

A Need for Assessing Discriminant Validity

Hofstede (1980) defined culture as the "*collective programming of the mind, which distinguishes the members of one category of people from another.*" This definition stresses that culture is collective and not a characteristic of individuals (shared values); is interesting only to the extent that it differentiates between categories of people (Maull *et al.*, 2001).

Yet, despite the fact that it's the differences in culture that makes it an interesting phenomenon, the literature review revealed that reporting on the ability of organisational culture instruments to assess cultural differences between companies is grossly neglected. The literature often reports on the consensual, construct, and criterion validity of organisation culture instruments, but not the discriminant validity of the instruments (Ashkanasy, Wilderom & Peterson, 2000). Hence, clearly there is a need to assess the discriminant validity of organisational culture instruments. This need is addressed in this study.

METHOD

The research participants

A convenience sample, consisting of 4066 participants from five different companies originating from various industries, was used. Particulars of organisations that are included in the study are provided in Table 1. From Table 1 it is clear that there are significant differences in sample size (ranging from 119 to 2459) between the different organisations. Noting that sample size effects levels of significance, due consideration was given to it during the analysis phase.

TABLE 1
PARTICIPATING ORGANISATIONS

Company No.	Organisation	N
1	Bank	1056
2	Bank – Home Loans	219
3	Retail	119
4	Information Technology	213
5	Services – Parastatal	2459
Total		4066

Table 2 provides a brief overview of the biographical properties of the survey sample. From Table 2 it can be inferred that the majority of respondents are white, male, Afrikaans speaking and in the age group 25 – 35.

TABLE 2
BIOGRAPHICAL VARIABLES

Category	Count	%
Race		
White	1086	26.71%
Coloured	294	7.23%
Indian	125	3.07%
Black	912	22.43%
No response	1649	40.56%
Total	4066	100%
Age		
24 and younger	438	10.77%
25 – 35	1808	44.47%
36 – 45	1006	24.74%
46 and more	638	15.69%
No response	176	4.33%
Total	4066	100%
Gender		
Male	2034	50.02%
Female	1876	46.14%
No response	156	3.84%
Total	4066	100%
Language		
Afrikaans	1014	24.94%
English	225	5.53%
Other	21	0.52%
No response	2806	69.01%
Total	4066	100%

The measuring instrument

The measuring instrument (Culture Assessment Instrument) was developed by Martins (1989). The latest version of the CAI consists of 89 items, but only 56 items, that were common to all the companies in the sample, were included in the study. These 56 items are proportionally representative of the six dimensions of the questionnaire. The overall reliability (Cronbach

Coefficient Alpha) of the 5-point response scale version of the instrument, used in this study, is 0,933. The internal consistency of the dimensions varies between 0,655 and 0,932.

The theoretical model, which underpins the CAI, is depicted in Figure 2. According to Martins (1989) an organisation is a complex social system in which individual and group activities take place. The various subsystems together form the culture of the organisation. Organisational culture influences the behaviour of employees, suppliers and customers as well as the relationship with the community. Culture has an effect on the internal as well as the external environment and is in turn influenced by both environments. The reason being that the organisation has to continuously adapt to the external environment. In order for the organisation to adapt to the external environment its internal processes have to change and adapt on a continuous basis.

From Figure 2 it can be seen that the model consists of three main elements, i.e. the organisational system, survival functions and dimensions of culture.

The organisational system consists of five subsystems i.e., goal -, technical -, structural -, psychosocial -, and management subsystem. These five subsystems form the internal subsystem. The external system consists of the environment in which the organisation operates. The organisation thus has to stay abreast of shareholders, customers, competitors, the community, as well as political, statutory, economic and ecological factors. The way, in which all the external factors are dealt with, could have a major impact on the success and survival of the organisation. As a result of the interaction and reciprocal influence of the various subsystems on one another, a unique culture is created in each organisation, which makes it unique and distinguishes it from other organisations.

From Figure 2 it is clear that the two main variables that must be taken into account in assessing the culture of an organisation are the problems of survival and adaptation of the organisation to the (a) external environment and (b) the internal organisational system.

Dimensions of culture are subdivided into two categories, i.e. those that relate to the external environment and those that relate to the internal environment (See Figure 2). Dimensions relating to the external environment are: (a) Strategy, mission, goals and objectives; (b) Shareholders, customers, competitors and community; and (c) The means to reach goals.

Dimensions relating to the internal environment are: (a) Employees in the organisation; (b) Interpersonal relations; (c) Management processes; and (d) Management orientation.

The research procedure
The data set was built from data gathered from the five participating companies over the past few years. The information was gathered mainly with a view to improve the performance of the companies. Hence, the aim in gathering the information was the same in all the cases.

Statistical analysis
The statistical procedures were selected for their suitability to test the research hypotheses of the study. These procedures include descriptive statistics, factor analyses, and analyses of variance. In respect of factor analyses a procedure developed by Schepers (1992) was followed. This procedure includes first as well as second level factor analyses. The Statistical Consultation Service of the Rand Afrikaans University conducted the analyses. All calculations were done by means of the SPSS – Windows program of SPSS – International.

RESULTS

First level factor analysis on the inter-correlation matrix
The 56 items of the Culture Assessment Instrument were intercorrelated and rotated to a simple structure by means of the Varimax rotation. Owing to limited space, the intercorrelation matrix (56 x 56) is not reproduced here. Principal Axis Factoring was used as the extraction method.

Based on Kaiser's (1961) (eigenvalues-greater-than-unity) criterion nine factors were postulated. Subsequently, sub-scores (SS) were calculated for these nine factors. Meaningful item
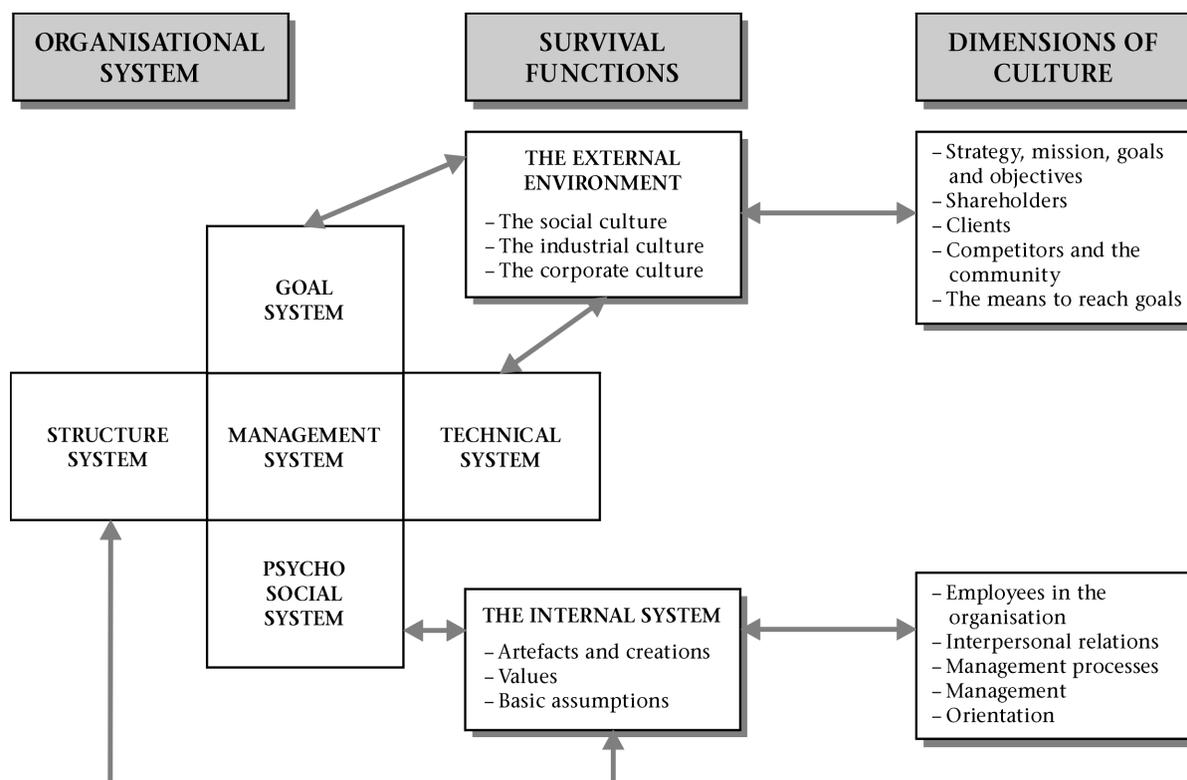

Figure 2: A Model of Organisational Culture
(Martins, 1989, p.92)

loadings were obtained on eight of the nine postulated factors. These eight factors, which explain about 46% of the variance in the factor space, were retained for second level factor analysis.

Second level factor analysis on the inter-correlation matrix
The eight sub-scores (obtained from the first factor analysis) were inter-correlated and the results of the inter-correlation of the sub-scores are displayed in Table 3.

TABLE 3
MATRIX OF INTER-CORRELATIONS OF SUB-SCORES (SS)

	SS 1	SS 2	SS 3	SS 4	SS 5	SS 6	SS 7	SS 8
SS 1	1,000							
SS 2	0,628	1,000						
SS 3	0,682	0,615	1,000					
SS 4	0,556	0,414	0,433	1,000				
SS 5	0,612	0,603	0,555	0,504	1,000			
SS 6	0,417	0,457	0,517	0,294	0,411	1,000		
SS 7	0,353	0,214	0,246	0,109	0,141	0,136	1,000	
SS 8	0,319	0,311	0,255	0,195	0,273	0,246	0,145	1,000

All Correlations are significant at the 0,01 level (2-tailed).

According to Kaiser's (1961) criterion a single factor was postulated. Table 4 provides the eigenvalues of the unreduced factor matrix. This factor explained 48% of the variance in the factor space.

TABLE 4
EIGENVALUES OF THE UNREDUCED INTER-CORRELATION MATRIX OF SUBSCORES

	Initial Eigenvalues		
Root	Total Variance	% of %	Cumulative
1	3,827	47,841	47,841
2	0,942	11,775	59,616
3	0,844	10,556	70,172
4	0,703	8,790	78,962
5	0,610	7,629	86,591
6	0,504	6,304	92,895
7	0,321	4,006	96,901
8	0,248	3,099	100,000

Trace = 8

The factor solution converged after 5 iterations. Table 5 provides the rotated factor matrix of the CAI.

TABLE 5
SORTED FACTOR LOADINGS ON POSTULATED FACTOR

Sub-Scores	Scale 1	h²j
SS 1	0,858	0,660
SS 2	0,823	0,591
SS 3	0,811	0,595
SS 4	0,616	0,372
SS 5	0,601	0,330
SS 6	0,564	0,316
SS 7	0,374	0,131
SS 8	0,304	0,129

Extraction Method: Principal Axis Factoring.
1 factor extracted. 5 iterations required.

An iterative item analysis procedure was conducted on this single scale and a very high Cronbach Coefficient Alpha of 0,945 was obtained. Table 6 provides the item statistics for the CAI.

TABLE 6
ITEM STATISTICS OF THE CAI

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Q2	182,310	1120,033	0,300	0,945
Q3	182,416	1113,948	0,327	0,945
Q4	182,917	1094,479	0,526	0,944
Q5	183,421	1102,019	0,441	0,944
Q6	183,172	1093,445	0,473	0,944
Q7	182,126	1125,377	0,194	0,945
Q8	182,333	1109,236	0,396	0,944
Q10	182,539	1104,559	0,474	0,944
Q11	182,775	1100,582	0,560	0,944
Q12	182,822	1094,317	0,513	0,944
Q13	182,912	1095,447	0,460	0,944
Q14	182,835	1095,843	0,506	0,944
Q15	182,434	1106,652	0,381	0,944
Q19	183,246	1097,836	0,443	0,944
Q20	182,797	1104,650	0,366	0,945
Q21	182,518	1110,650	0,324	0,945
Q23	183,352	1083,842	0,584	0,943
Q24	183,410	1089,231	0,612	0,943
Q25	183,228	1086,502	0,560	0,943
Q26	182,655	1117,183	0,242	0,945
Q27	182,657	1112,705	0,361	0,944
Q28	183,209	1086,742	0,573	0,943
Q29	182,781	1096,212	0,520	0,944
Q30	182,934	1091,020	0,586	0,943
Q31	183,243	1091,040	0,561	0,943
Q33	183,098	1092,359	0,580	0,943
Q34	183,024	1082,393	0,667	0,943
Q36	182,333	1122,885	0,203	0,945
Q37	182,636	1116,514	0,304	0,945
Q39	183,280	1089,542	0,536	0,944
Q41	183,374	1093,897	0,529	0,944
Q42	183,493	1084,821	0,602	0,943
Q43	183,256	1093,593	0,529	0,944
Q44	182,838	1104,725	0,415	0,944
Q45	182,919	1103,466	0,453	0,944
Q46	183,076	1090,547	0,569	0,943
Q47	183,350	1103,241	0,405	0,944
Q49	182,981	1092,726	0,578	0,943
Q51	183,080	1104,398	0,427	0,944
Q52	182,617	1106,825	0,444	0,944
Q54	182,556	1116,923	0,310	0,945
Q55	182,939	1084,958	0,621	0,943
Q57	182,958	1092,115	0,470	0,944
Q59	183,427	1097,552	0,465	0,944
Q60	183,652	1097,560	0,480	0,944
Q62	182,614	1096,302	0,567	0,943
Q63	182,702	1095,184	0,577	0,943
Q64	182,889	1089,848	0,596	0,943
Q65	182,856	1093,133	0,586	0,943
Q66	182,451	1098,969	0,499	0,944
Q67	182,801	1096,741	0,547	0,944
Q68	183,284	1106,092	0,406	0,944
Q70	182,767	1098,537	0,507	0,944
Q71	182,827	1102,382	0,471	0,944
Q73	182,823	1088,629	0,603	0,943
Q72	183,072	1128,213	0,095	0,946

N of Cases = 4066
N of Items = 56
Cronbach Coefficient Alpha = 0,945

Analysis of variance (ANOVA): comparison between companies
In order to test the hypothesis of the study, which states that there are significant differences in the culture scores between companies from various industries, an analysis of variance was carried out on the data set. The results of these analyses are depicted in Tables 7 – 10. In Table 7 the aggregate mean for each organisation is depicted.

TABLE 7
DESCRIPTIVE STATISTICS

Company	Mean	Std. Deviation	N
Bank	191,460	26,800	1056
Bank – Home Loans	191,877	27,940	219
Retail	186,244	33,051	119
Information Technology	177,545	29,061	213
Services – Parastatal	184,244	36,821	2459
Total	186,237	33,749	4066

From Table 7 it is clear that the company in the banking industry has the highest mean (192), whilst the company in the information technology industry has the lowest mean (177). This means that the culture of the company in the banking industry was most positively assessed, whilst the culture of the company in the IT industry was least positively assessed.

Analysis of variance was preceded with the Levene's test for the equality of error variances. The results are depicted in Table 8.

TABLE 8
LEVENE'S TEST OF EQUALITY OF ERROR VARIANCES (A)

F-ratio	df1	df2	P(F)
45,214	4	4061	0,000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

From Table 8 it can be inferred that the error variance of the dependent variable is not equal across the companies, and the Dunnett post hoc tests should therefore be interpreted (See Table 10).

The differences in variance between the companies are depicted in Table 9. At a first glance it would appear that there are significant differences in mean culture scores between the different companies.

TABLE 9
ANOVA: COMPARISON BETWEEN ORGANISATIONS IN RESPECT OF CULTURE

Source	Type III Sum of Squares	df	Mean Square	F-ratio	P(F)	Partial Eta Squared
Corrected Model	61640,548(a)	4	15410,137	13,698	0,000	0,013
Intercept	45611830,805	1	4561183,805	40545,511	0,000	0,909
COMP	61640,548	4	15410,137	13,698	0,000	0,013
Error	4568437,846	4061	1124,954			
Total	145655506,000	4066				
Corrected Total	4630078,394	4065				

a) R Squared = 0,013 (Adjusted R Squared = 0,012)

However, it must be kept in mind that the sample sizes differ considerably. Thus, in order to make accurate inferences, it was necessary to make provision for the differences in sample size. For this purpose the Partial Eta Squared was calculated.

Partial Eta Squared revealed that only an insignificant portion, namely 1,3% of the variance could be attributed to culture differences.

The results of the Dunnett *post hoc* tests are depicted in Table 10. From Table 10 it can be seen that the Bank and Home Loans are significantly different from IT and Services, but as mentioned above only an insignificant small portion of the variance could be explained.

TABLE 10
DUNNETT POST HOC TESTS

(I) Company	(J) Company	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Bank	Home Loans	-,4165	2,060	1,000	-6,224	5,391
	Retail	5,216	3,140	0,639	-3,712	14,145
	IT	13,916(*)	2,155	0,000	7,838	19,994
	Services	7,216(*)	1,110	0,000	4,107	10,326
Home Loans	Bank	,416	2,060	1,000	-5,391	6,224
	Retail	5,633	3,570	0,704	-4,462	15,720
	IT	14,332(*)	2,744	0,000	6,612	22,052
	Services	7,633(*)	2,029	0,002	1,912	13,355
Retail	Bank	-5,216	3,140	0,639	-14,145	3,712
	Home Loans	-5,633	3,570	0,704	-15,728	4,462
	IT	8,699	3,626	0,159	-1,549	18,948
	Services	2,000	3,119	0,999	-6,873	10,874
IT	Bank	-13,916(*)	2,155	0,000	-19,994	-7,838
	Home Loans	-14,332(*)	2,744	0,000	-22,052	-6,612
	Retail	-8,699	3,626	0,159	-18,948	1,549
	Services	-6,699(*)	2,125	0,018	-12,695	-0,703
Services	Bank	-7,217(*)	1,110	0,000	-10,326	-4,107
	Home Loans	-7,633(*)	2,029	0,002	-13,355	-1,912
	Retail	-2,000	3,119	0,999	-10,874	6,873
	IT	6,699(*)	2,125	0,018	0,703	12,695

* The mean difference is significant at the .05 level.

Hence, the hypothesis, which states that there are significant differences in mean culture scores between the different companies in the sample, is rejected. It can thus be concluded that the instrument does not posses discriminant validity, i.e. the capability to distinguish culture between companies from different industries.

DISCUSSION

It is clear from the factor analyses and the item analysis that the construction of the CAI is based on a number of sound psychometric principles. The CAI complies with most of the criteria, which according to Schepers (1992) as cited in Swart, Roodt and Schepers (1999) are important in constructing a questionnaire:
- The construct "culture" is theoretically clearly founded.
- There is no doubt about which domain the construct belongs to, i.e. "organisational culture"
- Sub domains were identified, i.e. Mission/Vision; Management Processes; Employee Needs and Objectives; External Environment; Means to Achieve Objectives; and Interpersonal Relations.
- Behavioural indicators were identified for the sub domains. These behavioural indicators were used to link the theoretical concepts with the empirical variables.

The one criterion that was somewhat neglected is item format, which includes aspects such as:

- The question should be short and simple.
- The question should be clear and unambiguous.
- The respondent should have the necessary knowledge to answer the question.
- The question should be phrased neutrally.
- The question should not make the respondent feel guilty.
- The question should be asked on the highest level of measurement that would still make sense. The questionnaire uses a 5-point Likert response scale where all the response categories are labelled. According to Schepers (1992) the equal interval quality of a scale is lost if more than two points are anchored. Schepers (1992) recommended that it is better to use an intensity response scale where only the two extreme categories are labelled as depicted in Figure 3.

1	2	3	4	5

Strongly disagree   **Strongly agree**

**Figure 3: Proposed Intensity Response Scale
Schepers (1992, p.14)**

The factor analyses resulted in a robust single factor that indicates a fairly sound theoretical basis as well as a sound procedure in the construction of the CAI. This assumption is supported by a high internal consistency of 0,945. This indicates a high reliability and only a limited amount of error variance in the measurement of the construct "organisational culture".

The results of the analysis of variance revealed that there are differences in mean culture scores between the various companies. However, as mentioned before only 1,3% of these differences could be attributed to differences in cultures. In other words the culture of the bank is the same as the culture of the retail chain store, is the same as the culture of the public service organisation and is the same as the culture of the information technology organisation.

However, based on the literature review, a priori differences in cultures between companies, especially if they are from various industries were postulated. The CAI did not detect these differences. It can thus be inferred that the instrument does not possess the ability to distinguish differences in cultures between companies from different industries. These findings suggest that the CAI lacks discriminant validity.

On the other hand the CAI reliably assessed communalities in culture between companies. This is the strength of the instrument. It is good at detecting communalities between companies. See Figure 4 for a graphic representation of what the findings suggest. In Figure 4 each circle represents a different company and the shaded area represents the similarities between the companies, as identified by the instrument. The areas not shaded represent the unique differences between the companies, not identified by the instrument.

These communalities, however, are mainly at surface level – the level of artefacts and creations with reference to Schein's (1985) three-level typology (See Figure 1). At this level companies may appear to have the same culture. The reason for this phenomenon is that companies are quick to embrace the latest management tools and practices in their striving to keep up with the fast changing business environment. There is a possibility that the instrument detected these practices which are common to all companies.

In sum, the instrument identifies similarities at surface level but not differences at the deeper levels. The scale was designed for the tangible, espoused level (the level of practice if you wish) but not for the deeper (unconscious) level of tacit values and basic assumptions. Inferences can be made about the deeper levels, but the items in the instrument did not purposefully and systematically expose the deeper levels of organisational culture.
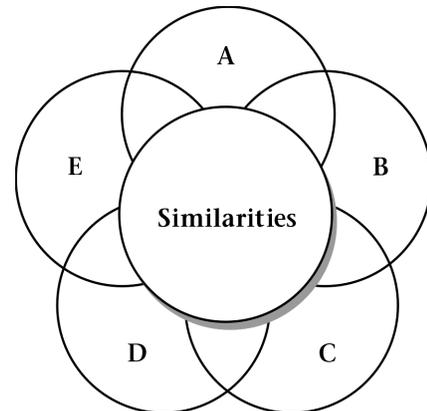

Figure 4: Similarities between Companies

Emanating from the findings of the literature and the empirical research it is recommended that further research be undertaken to operationalise the construct organisational culture at the deeper levels, which are, the levels of tacit values, taken for granted assumptions and basic beliefs. The authors believe that with proper operationalisation at the more fundamental levels it will be possible to successfully distinguish cultures between companies from the positivistic paradigm.

Finally, It is recommended that the application of the Culture Assessment Instrument be supplemented with methods from the interpretative paradigm for a holistic and comprehensive view on the culture of a company.

REFERENCES

Ajiferuke, M. & Boddewyn, J. (1970). Socioeconomic indicators in comparative management. *Administrative Sciences Quarterly*, December, 453-458.

Amsa, P. (1986). Organizational culture and work group behaviour: an empirical study. *Journal of Management Studies* (UK), *23* (3), 347-62.

Ashkanasy, N.M., Broadfoot, L.E. & Falkus, S. (2000a). Questionnaire measures of organizational culture. In Ashkanasy, N.M., Wilderom, C.P.M. & Peterson, M.F. (Eds.), *Handbook of organizational culture and climate*. California: Sage Publications, Inc.

Ashkanasy, N.M., Wilderom, C.P.M. & Peterson, M.F. (Eds.) (2000b), *Handbook of organizational culture and climate*. California: Sage Publications, Inc.

Barley, S. R., Meyer, G. W., & Gash, D. C. (1988). Cultures of culture: Academics, practitioners and the pragmatics of normative control. *Administrative Science Quarterly*, *33*, 24-60.

Barnett, G.A. (1988). Communication and organizational culture. In Goldhaber, G.M. & Barnett, G.A. (Eds), *The handbook of organizational communication* (101-30). Ablex, Norwood.

Beyer, J.M., Hannah, D.R. & Milton, L.P. (2000). Ties that bind: culture and attachments in organisations. In Ashkanasy, N.M., Wilderom, C.P.M. & Peterson, M.F. (Eds), *Handbook of organizational culture & climate* (323-338). California: Sage Publications, Inc.

Bolman, L. & Deal, T. (1991). *Reframing organisations: artistry, choice and leadership*. San Francisco, CA.: Jossey-Bass Publishers.

Bookbinder, S.M. (1984). Measuring and managing corporate culture. *Human Resource Planning*, *7* (1), 47-53.

Cooke, R.A. & Rousseau, D.M. (1988). Behavioural norms and expectations: A quantitative approach to the assessment of organizational culture. *Group and Organization Studies*, *13*, September, 245-73.

Denison, D.R. (1996). What is the difference between organizational culture and organizational climate? A native's point of view on a decade of paradigm wars. Academy of *Management Review*, *21*, 619-654.

Desatnick, R.L. (1986). Management climate surveys: a way to uncover an organization's culture. *Personnel*, *63* (5), 49-54.

Erwee, R., Lynch, B., Millett, B., Smith, D. & Roodt, G. (2001). Cross-cultural equivalence of the organisational culture survey in Australia. *Journal of Industrial Psychology*, *27* (3), 7-12.

Frost, P.J., Moore, L., Louis, M., Lundberg, C. & Martin, J. (Eds) (1991), *Reframing organisational culture*. Beverly Hills, CA: Sage Publications.

Gabriel, Y. (1991), Turning facts into stories and stories into facts: a hermeneutic exploration of organizational folklore. *Human Relations*, *44* (8), 857-75.

Green, L. (1989). Corporate culture asset or liability. *Human Resource Management Yearbook*, 72-74.

Groeschl, S. & Doherty, L. (2000). Conceptualising culture. *Cross Cultural Management – An International Journal*, *7* (4), 12-17.

Hofstede, G. (1980). *Culture's consequences*. Beverly Hills, CA: Sage.

Hofstede, G. (1986). Editorial: The usefulness of the 'organizational culture' concept. *Journal of Management Studies*, *23* (3), May, 253-57.

Kaiser, H.F. (1961). A note on Guttman's lower bound for the number of common factors. *British Journal of Statistical Psychology*, *14* (1), 1.

Kroeber, A. & Kluckhohn, F. (1952). *Culture: A critical review of concepts and definitions*, Cambridge, Mass.: Harvard Business Review.

Martin, J. & Meyerson, D. (1988). Organisational culture and the denial, channelling and acknowledgement of ambiguity. In Pondy, L.R., Boland, Jr., R.J. & Thomas, H. (Eds), *Managing ambiguity and change*. New York. NY: John Wiley & Sons.

Martin, J. (1992). *Cultures in organizations: Three perspectives*. New York: Oxford University Press.

Martins, N. (1989). *Organisasiekultuur in 'n finansiële instelling* (D.Phil-proefskrif). Pretoria: University of Pretoria. (Unpublished).

Maull, R., Brown, P. & Cliffe, R. (2001). Organisational culture and quality improvement. *International Journal of Operations & Production Management*, *21* (3), 302-326.

Nossiter, V. & Biberman, G. (1990). Projective drawings and metaphor: analysis of organisational culture. *Journal of Managerial Psychology* (UK), *5* (3)13-6.

O'Reilly, C. A., III, Chatman, J. A., & Caldwell, D. F. (1991). People and organizational culture: A profile comparison approach to assessing person-organization fit. *Academy of Management Journal*, *34*, 487-516.

Ott, J.S. (1989). *The organisational culture perspective*. Chicago: Dorsey Press.

Reichers, A. E., & Schneider, B. (1990). Climate and culture: An evolution of constructs. In B. Schneider (Ed.), *Organizational climate and culture* (5-39). San Francisco: Jossey-Bass.

Rentsch, J. R. (1990). Climate and culture; Interaction and qualitative differences in organizational meanings. *Journal of Applied Psychology*, *75*, 668-681.

Reynierse, J.H. & Harker, J.B. (1986). Measuring and managing organizational culture. *Human Resource Planning*, *9* (1), 1-8.

Reynierse, J.H. (1986). Measuring corporate culture. *The Business Magazine*, September- October, 64-67.

Reynolds, P.D. (1986). Organizational culture as related to industry, position and performance: a preliminary report. *Journal of Management Studies* (UK), Vol. (*23*), 333-45.

Rousseau, D.M. (1990). Assessing organizational culture: The case for multiple methods. In B. Schneider (Ed.), *Organizational climate and culture* (153-192). San Francisco: Jossey-Bass.

Schein, E.H. (1985). *Organizational culture and leadership: A dynamic view*. San Francisco, CA: Jossey-Bass.

Schein, E.H. (1990). Organizational culture. *American Psychologist*, *45*, 109-119.

Schepers, J.M. (1992). *Toetskonstruksie: Teorie en praktyk*. Johannesburg: RAU Press.

Swart, C., Roodt, G., & Schepers, J.M. (1999). Itemformaat, differensiële itemskeefheid en die faktorstruktuur van 'n selfvoltooiingsvraelys. *Tydskrif vir Bedryfsielkunde*, *25* (1), 33-43.

Tucker, R.W., McCoy, W.J. & Evans, L.C. (1990). Can questionnaires objectively assess organisational culture? *Journal of Managerial Psychology* (UK), *5* (4), 4-11.

Van Maanen, J. (1991). The smile factory: work at Disneyland. In Frost, P.J., Moore, L., Louis, M., Lundberg, C. & Martin, J. (Eds). *Reframing organisational culture*. Beverly Hills, CA: Sage Publications.

Wiener, Y. (1988), Forms of value systems: a focus on organizational effectiveness and cultural change and maintenance. *Academy of Management Review*, *13* (4), 534-45.

Wilson, A. M. (2001). Understanding organisational culture and the implications for corporate marketing. *European Journal of Marketing*, *35* (3/4), 353-367.

Xenikou, A., & Furnham, A. (1996). A correlational and factor analytic study of four questionnaire measures of organizational culture. *Human Relations*, *49* (349-371).