Routledge
Taylor & Francis Group

Construction Management and Economics

ISSN: 0144-6193 (Print) 1466-433X (Online) Journal homepage: https://www.tandfonline.com/loi/rcme20

Organisational culture profiles of construction enterprises in China

S. B. Zhang & Anita M. M. Liu

To cite this article: S. B. Zhang & Anita M. M. Liu (2006) Organisational culture profiles of construction enterprises in China, Construction Management and Economics, 24:8, 817-828, DOI: 10.1080/01446190600704604

To link to this article: https://doi.org/10.1080/01446190600704604

Construction Management and Economics (August 2006) **24**, 817–828

Organisational culture profiles of construction enterprises in China

S. B. ZHANG[1] and ANITA M. M. LIU[2]*

[1]*School of Management, Tianjin University, China*
[2]*Department of Real Estate and Construction, University of Hong Kong, Pokfulam, Hong Kong*

Received 25 February 2005; accepted 3 March 2006

The vast economic growth in China in the past decade has brought forth opportunities for the development of its construction industry. However, the construction industry in China has been criticised for poor performance and low effectiveness in terms of quality and profitability in the face of challenges and uncertainties resulting from the fast changing economic environment. Given that organisational culture plays a significant role in work performance and effectiveness, the apparently low effectiveness of the construction industry may be related to the culture of the contractors' organisations. The culture–effectiveness (C-E) relationship has received increased attention in organisational research and the aim of the study is to develop a culture–effectiveness model of the contractors' motivated behaviour towards performance. Results of cluster analysis of the culture profiles of Chinese construction enterprises show that hierarchy and clan cultures are dominant and that culture profiles of Chinese contractors may vary in different geographical regions.

Keywords: Behaviours, motivation, organisational culture, performance effectiveness, schemas

Introduction

In the past two decades, there has been rapid and extensive economic growth in China that has brought forth major opportunities for the development of its construction industry. For instance, the value of the total investment in fixed assets increased from RMB 91 billion in 1980 to RMB 2,988 billion in 1999 (China National Bureau of Statistics, 2002a, 2002b). However, Chinese contractors[1] are often accused of poor performance and low effectiveness in terms of quality and profitability (Yao, 1998; Sha and Lin, 2001). Hence, ways to improve the effectiveness of Chinese construction enterprises are considered important and the postulation that there is a relationship between organisational culture and organisational effectiveness is worth investigation.

There are many environmental and project factors that affect the performance effectiveness of the construction enterprises, some of which may fall outside their immediate control. However, organisational characteristics that fall under the control of management, and which represent how the enterprises organise themselves in response to the environmental challenges, are most crucial in determining consistency of their effectiveness. Hu (2001) postulates that the ability of the construction enterprises to successfully organise themselves internally and respond to the environment externally is related to their organisation culture, an intangible force currently believed to play a tangible role in affecting the competitiveness, development and ultimate survival of the organisations.

*Author for correspondence. E-mail: ammliu@hkucc.hku.hk

Organisational culture and effectiveness: a review

In the past 20 years, it has been increasingly recognised that organisations, ostensibly similar as they are in terms of structure, may differ substantially in their performance and effectiveness. There are factors that seem to permeate organisational life and influence every aspect of organisation operation. The study of organisational culture stems from such realisation, by organisational scholars as well as practitioners, with a belief that once the ambiguity and unpredictability of

Construction Management and Economics
ISSN 0144-6193 print/ISSN 1466-433X online © 2006 Taylor & Francis
http://www.tandf.co.uk/journals
DOI: 10.1080/01446190600704604

organisations are understood, their performance and effectiveness could be greatly improved by adopting better organisational designs (Brown, 1998). As Schein (1985, p. 1) puts it, 'The concept of organisational culture holds promise for illuminating this difficult area' and since the early 1980s, culture studies have acquired prominent status in the management field.

The culture–effectiveness link studies (see Vesson, 1993; Wilderom *et al.*, 2000) can be divided into three stages of development:

The budding stage

In the field of organisational research, the culture–effectiveness link studies develop alongside the emergence of the human relations school with '(the *Hawthorne studies* being) the turning point in the development of the human relations movement' (Mullins, 1999, p. 58), indicating implicitly how group culture affects performance. Jaques (1951, 1965) relates the customary and traditional ways of thinking and doing things to the working behaviours of employees. Although the effects of the commonly shared 'ways of thinking and doing things' are not directly investigated, his findings indicate that organisational culture could be a serious barrier to productivity if it were not congruent with the organisational structure and environment. Pfiffner and Sherwood (1960) suggest that there may be a relationship between the culture and the effectiveness of a firm, but they do not conduct any further investigation of the nature of such a hypothesised link. Silverzweig and Allen (1976) then look into the effect of culture on the performance of an organisation. Of their eight case studies, which involve various branch organisations that have suffered losses and intended to raise their effectiveness, six organisations improve their performances substantially after changing their culture. Such findings lead them to suggest that there is a close link between culture and performance of an organisation.

The promulgation stage

The end of the 1970s marked a clear change from implicit attention to the culture–performance/effectiveness link, with the attempt to explain the success of Japanese enterprises at that time. Ouchi is one of the scholars to arouse people's attention to the importance of employees' commitment and the unitary vision for the organisation's success, by arguing (Ouchi and Jaeger, 1978; Ouchi and Johnson, 1978) that emphasis on certain humanistic values contributes to the organisation's economic performance. These values include employee concern and consensual decision making which, generally, characterise Japanese enterprises. Based on their experiences with more than 30 Japanese and American organisations, Pascale and Athos (1981) put forward a similar idea that the higher productivity of Japanese organisations is attributable to their emphasis on human relations, by arguing that focus on skills, style and employee goals leads to high performance. That strong culture has made the difference between successful organisations and less successful ones is claimed by Peters and Waterman (1982), who argue that superior performance is to be achieved only if the organisations move to a more adaptive and humanistic approach from a pure technical and rationalistic approach. Deal and Kennedy (1982) also put forward a similar view that a strong culture is able to respond well not only to the environment, but also to changing circumstances, thus enhancing organisational performance.

The testing stage

The doubts and scepticism (Carroll, 1983; Hitt and Ireland, 1987) concerning the culture–effectiveness link lead to a large volume of empirical studies to explore the cultural phenomenon of organisations. The major researchers include: Barley *et al.* (1988), Cooke and Rousseau (1988), Denison (1990), Rousseau (1990), Calori and Sarnin (1991), Gordon and DiTamaso (1992), Kotter and Heskett (1992), Marcoulides and Heck (1993), Petty *et al.* (1995) and Denison and Mishra (1995). The findings of research studies, though different to some degree, do show a culture–effectiveness link. Relying on co-relational techniques, most of the studies are not able to establish a firm direction of such relationship, the significant correlations indicate possible causal relationship between organisational culture and effectiveness that should be investigated further (Wilderom *et al.*, 2000).

While culture has been gaining in popularity in the general management field, culture studies in construction management also have intensified. Maloney and Federle (1991, 1993) introduce the competing values framework as their paradigm for analysing the cultural elements in American engineering and construction organisations. Gale (1992) looks at culture as a means to reduce conflicts in construction. Seymour and Rooke (1995) present their views of the culture of the UK construction industry. Rowlinson and Root (1996) offer their views of the impact of culture on project performance. Hall and Jaggar (1997) note the importance of culture differences in international construction. Liu and Fellows (1999a, 1999b) highlight the culture issues in project procurement and also explore the impact of culture on project goals. With the Hong Kong real estate profession as the research context, Liu (1999) explores the relationships between cultural

dimensions, strength and the real estate professionals' perceived job satisfaction. Kwan and Ofori (2001) examine the influence of Chinese culture on partnering success.

At present, culture research findings are not entirely consistent with one another. Owing to the complex nature of the constructs of *organisational culture* and *effectiveness*, there is a lack of an integrative and comprehensive framework for C-E (culture–effectiveness) research.

Developing the C-E model

Behavioural approach

One of the key challenges in research of the organisational culture and effectiveness (C-E) link relates to the establishment of a theoretical base for explaining the assumed relationships (Wilderom *et al.*, 2000). In such C-E studies, most of the ideas about the relationship between culture and effectiveness have attributed the success of organisations to some combinations of values, beliefs and practices at the core of an organisation's social system. Such attributions imply the link without indicating the mechanism of how organisational culture operates on the final outcome. In order to substantiate the assumed link, the operating mechanism of organisational culture on behaviour has to be understood in order to further its link to (effective) behavioural outcome.

Behaviour is a core element in the understanding of culture. According to Hofstede (1993, p. 89), culture is a construct, i.e. 'culture is not directly accessible to observation but inferable from verbal statements and other *behaviours* and useful in predicting still other observable and measurable verbal and nonverbal *behaviour*'. Thus, organisational culture refers to visible happenings, structures and *behaviours* of people within an organisation. Schein (1992) states the major categories that are associated with the notion of organisational culture as (1) observed *behavioural* regularities when people interact, the language they use, the customs and traditions that evolve, and the rituals that are employed (Jones *et al.*, 1988); (2) espoused values (Deal and Kennedy, 1982); (3) the broad policies and ideological principles that underlie a groups' *actions* towards their stakeholders (Ouchi, 1981).

Culture provides the framework for interpreting the interactive, ongoing, recreative aspects of organisations, beyond the merely rational or economic. Culture is defined (among numerous definitions) as a system of meaning that accompanies the myriad of *behaviours*, practices recognised as a distinct way of life (Gregory, 1983). *Behaviours* are observable and therefore used to induce the understanding of culture.

In the study of behaviour, the traditional S-O-R (stimulus–organism–response) paradigm (expanded in Naylor *et al.*, 1980, to model the process of acts–product–outcome) has been applied by Liu and Walker (1998) in the modelling of the construction procurement process in terms of the B-P-O (behaviour–performance–outcome) cycle. The B-P-O cycle assumes that the basic conscious actions of the individual are the actions of choice, i.e. judgement and decision making which are influenced by norms and acceptable practices. Culture affects our choices of actions and the way we behave through (culturally bound) values and beliefs. Behaviour leads to performance, i.e., performance is determined by ability and behaviour, where Performance$=f$ (ability $\times$ motivation), and Ability$=f$ [aptitude $\times$ (training+experience)] (Vroom, 1964, 1995). Performance is also defined as an aggregate of behaviours over time, tasks or people (Mitchell, 1983). As such, performance is always linked with behaviour and is assessed by its outcome, hence the B-P-O cycle (see Figure 1), and motivation keeps the persons engaged in certain behaviours which would lead to the desired performance (B – P in Figure 1).

Behaviour is a response to stimulus in the S-O-R paradigm in psychology, which assumes that an individual is inactive until acted upon by some stimuli, i.e. the stimuli cause the acts. However, Atkinson (1982) argues that individuals are active before being exposed to stimuli, i.e. individuals are actively motivated to do many different things before exposure to a particular stimulus situation. Atkinson and Birch (1970) conceive the impact of the immediate environment (or stimulus situation) on behaviour to be the various instigating and inhibitory forces it produces and these influence the arousal of the individual's tendencies to engage or not to engage in certain activities, i.e., the individual's choice of behaviours is a response to the stimulus.

According to Rumelhart (1984), knowledge about any stimulus can be schematised and, therefore, individuals can have at their disposal many schemas

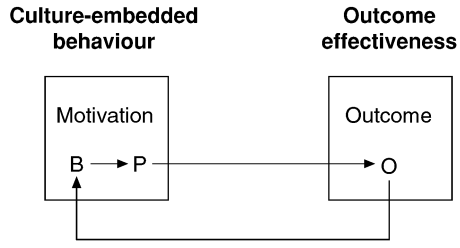


Figure 1 From behaviour to outcome. *Source*: Adapted from Liu (2003)

that direct their behaviours. Harris (1996) argues that organisation-context-specific schemas are most relevant to understanding organisational culture, since social knowledge is generally contextually bound. Culture scholars also stress human motivation from the perspective of culture. However, to assume that individuals are endowed with a fixed set of needs and that a social institution is there to satisfy them commits a fallacy of abstract individualism and yet to assume that culture is unproblematically internalised is to 'over socialise' the individual and oversimplify the process by which a person actively appropriates socially shared meaning (Kashima, 1997). Strauss (1992, p. 1) argues, in a broader sense, that human motivation is 'the product of interaction between events and things in the social world and interpretations of those events and things in peoples' psyches'. Therefore, the individual's choice of behaviours is related to his/her schema and such schema are culture-embedded.

Schema theory

Based on a detailed review of the social cognition literature, Markus and Zajonc (1985) conclude that schema theory is the most useful and pervasive perspective on the mechanics of social cognition. While there are many definitions of schema, the definition offered by Marshall (1995, p. 39) might be the most comprehensive:

> A schema is a vehicle of memory, allowing organization of an individual's similar experiences in such a way that the individual can easily recognize additional experiences that are also similar, discriminating between these and ones that are dissimilar; can assess a generic framework that contains the essential elements of all these similar experiences, including verbal and nonverbal components; can draw inferences, make estimates, create goals, and develop plans using the framework; and can utilize skills, procedures, or rules as needed when faced with a problem for which this particular framework is relevant.

As implied from the above definition, schemas serve as mental maps which enable individuals to orient themselves within their experimental terrain and guide interpretation of the past and present, as well as expectation for the future (Harris, 1996). The seven functions listed below are a summary from Taylor and Crocker (1981):

- Providing a structure against which experience is mapped;
- Directing information encoding and retrieval from memory;
- Affecting information processing efficiency and speed;
- Guiding filling gaps in the information available;
- Providing templates for problem solving;
- Facilitating the evaluation of experience;
- Facilitate anticipating of the future, goal setting, planning and goal execution.

Schemas are dynamic. Individuals, as members of an organisation, have constant interaction with colleagues. As schemas incorporate more and more new information, they become expanded and increasingly elaborate (Lord and Foti, 1986; Fiske and Taylor, 1991; Harris, 1996). Self schema (built up of the individual's perceived needs, values, ability, roles and expectancy) interact with schema from other organisational members, which together contribute to a culture schema built up of values and practices held by the organisation. Hence, schema theory suggests very important implications for expanding our understanding of the role of organisational culture in guiding sense making in organisations (see Figure 2).

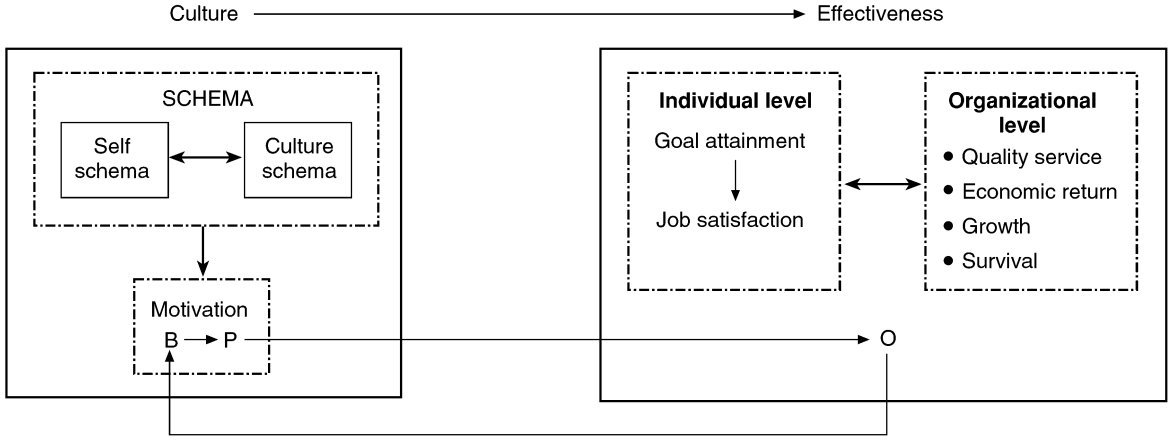


Figure 2 The C-E model

Outcome

Motivation theories suggest that people perform goal-directed acts to satisfy their needs. As individuals draw inferences and create goals, they are relying on their schemas (see D'Andrade, 1992, for more elaborate explanation of the relationship between schemas and motivation). Given all human conscious behaviours are motivated by their needs and goals (Newstorm and Davis, 1993), individuals tend to evaluate their performance against the attainment levels of such goals and the satisfaction levels of their needs as the effectiveness of their behavioural outcomes. In an organisation, rewards are basically classified in two categories: extrinsic rewards and intrinsic rewards (Robbins, 1996). However, the satisfaction of the employee is also dependent upon the fairness of the rewards according to equity theory (Adams, 1965). Hence, satisfaction is also influenced by the outcome of the individual's 'horizontal' comparison with other organisational members, particularly peers.

The above analysis focuses on the individual's (or micro level) perceived outcome effectiveness. The aggregate performance of organisational members leads to organisational (or macro level) outcome effectiveness since the performance of the organisation is, to a large extent, attributable to the aggregation of individual performances moderated by external environment contingencies. The evaluation of organisational effectiveness is analogous to organisational assessment. Organisational assessment requires that the definition(s) of performance be made explicit and that the organisation analyst determines, at the outset, whose value judgements and criteria would be operationalised and measured. Thus, effectiveness is defined as 'the degree to which (an organisation) realises its goals' (Etzioni, 1964) and, therefore, involves a comparison between the goal level and outcome level. Organisational effectiveness in culture studies is multi-dimensional, usually centring on such dimensions as customer service quality, market share and economic return, external adaptation and ultimate survival.

On the other hand, at the individual level, the person sets self-assigned goals based on his/her prior experience of the task and the level of aspiration. Once the acts are performed fully, the individuals will judge the results upon his/her level of aspiration in order to conclude a perceived performance level to be compared with the goal level originally set. If the performance level meets the goal level, the outcome is a success and would provide feelings of satisfaction. Feedback also plays a major role since it provides information (further stimulus) for setting future goal levels and aspiration (based on schema theory), which will subsequently affect behaviour and performance.

Given the idea that organisational culture is the *software of the mind* (Hofstede, 1991) that is shared by organisational members, it influences the cognition and perception of its members, guides their behaviours, integrates its internal processes to ensure the ability to survive and adapt to the environment (Schein, 1985; Cooke and Rousseau, 1988; Denison, 1990; Denison and Mishra, 1995; Cameron and Quinn, 1999). Therefore, it is postulated in Figure 2 that the cultural environment provides 'stimulus' to the individuals for the adoption of various schema which appropriately guide behaviours that may lead to the desired outcome.

Research design

From the above discussion of the relationship between organisational culture and effectiveness, the postulation is that the relationship between organisational culture and effectiveness is reciprocal and that organisational culture is both an asset and a liability, depending on its positive, or negative, impact on organisational effectiveness.

The research objective in this paper is to examine the organisational culture profiles of the construction enterprises in China and to discuss further research directions in assessing their effectiveness outcome.

The research design comprises two stages. The first stage involves preliminary case studies of selected Chinese construction enterprises with the purpose to test, and choose from, two culture-measuring instruments, i.e., OCI—Organisational Culture Inventory (Cooke and Szumal, 1993, 2000) and OCAI—Organisational Culture Assessment Instrument (Cameron and Quinn, 1999). Both OCI and OCAI have previously been widely used and tested as reliable in measuring organisational culture. Five construction companies from China north (Beijing and Tianjin) to China south (Shantou in Guangdong) are selected from the 'Complete list of the Chinese construction enterprises' (Ministry of Construction, 1996). The five construction enterprises in stage 1 are chosen on three basic considerations: (a) categorised as first-class construction enterprises[2] by the Ministry of Construction (MoC); (b) engaged in building construction, and similar in organisation size; (c) respondents hold relatively high positions. The results of the selected case studies are presented in this paper (which, from respondents' feedback and Cronbach alpha coefficients, show that OCAI is more suitable, in terms of validity and reliability, for measuring organisational culture of Chinese construction companies).

The second stage comprises a major survey of construction enterprises using OCAI to assess their

organisational culture profiles and cluster analysis is applied to analyse that sample into groups.

Results

Stage 1: preliminary case studies

Stage 1 comprises the preliminary case studies of five selected construction enterprises in order to identify the suitable culture-measuring instrument (either OCI or OCAI). Both OCAI and OCI are designed to measure the relatively shallow layers of organisational cultures, such as practices, norms or rules, and cultural phenomena, and these differences are likely to exist in Chinese construction enterprises. OCI is empirically found to be lengthy (120 questions) and respondents remark that the questions are not very clear—as far as interpretation by respondents in the specific Chinese cultural environment is concerned. The response rate on OCI is disappointingly low at 8% compared to that of around 40% (see Table 1) on OCAI. The Cronbach alpha coefficients for the culture types in OCI are lower (8 out of 12 culture types with Cronbach alpha less than 0.79, lowest being 0.22) than the OCAI (lowest Cronbach alpha at 0.79), hence, OCAI is adopted for the stage 2 major survey.

The number of respondents from each enterprise and the culture mean scores of the five enterprises in stage 1 are given in Table 1.

ANOVA confirms that all five enterprises differ significantly on all the OCAI questions relating to the four culture types, i.e. clan, adhocracy, hierarchy and market, and is explained in detail in Cameron and Quinn (1999) and Quinn and Rohrbaugh (1983). Each culture type contains six questions, hence, there is a total of 24 questions in OCAI that describe six scenarios, including dominant characteristics, organisational leadership, management of employees, organisational glue, strategic emphasis and criteria of success. Based on the 'content' of these six scenarios, four types of cultures are formulated, namely, clan, adhocracy, market and hierarchy. The six scenarios/questions are used to stimulate the respondents to interpret the relative resemblance of the cultures of their own enterprises. Clan culture describes an organisation that focuses on internal maintenance with flexibility, concern for people, and sensitivity to customers' adhocracy culture describes an organisation that focuses on external positioning with a high degree of flexibility and individuality; hierarchy culture describes an organisation that focuses on internal maintenance with a need for stability and control; and market culture describes an organisation that focuses on external positioning with a need for stability and control (Cameron and Quinn, 1999, p. 123). The figures marked in **bold** in Table 1 denote the dominant culture type in the particular enterprise. On average, hierarchy culture is the predominant type (mean score of 3.3441 on a modified OCAI 5 point scale); however, the Shantou enterprise is the exception with a predominantly market-oriented culture.

Stage 2: major survey

The major survey in stage 2 consists of stratified sampling from a total of 552 first-class enterprises. According to the MoC unofficially issued[3] 'A Complete Directory of First-class Construction Enterprises' in 1996, there are 2,127 officially approved first-class construction enterprises, of which there are 725 building construction enterprises. Among these 725 enterprises, 14 are of a military nature and under the administration of the army; 159 are collectively or privately owned; the 'purely civil (as in contrast to ''military'')' enterprises are 552 in total. Stratified random sampling is adopted by which enterprises with numbers that can be exactly divided by the figure '5' are selected from the (numbered) 552 enterprises as the survey subjects, thus reducing the total of 552 to 110—a relatively manageable number for organisational-level analysis. Each organisation is asked to return completed questionnaires from 20 respondents (data collection was finished in early 2003). That sample size of 110 is comparable to or larger than previous studies by Denison (1990), Hofstede *et al.* (1990).

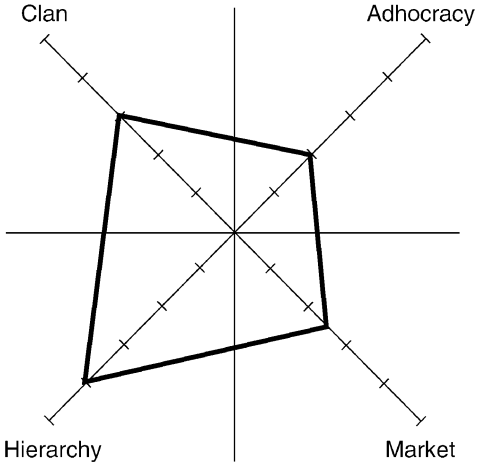
Table 1 Mean culture scores of construction enterprises in stage 1

Enterprise / Culture type	Beijing	Langfang	Tianjin	Gezhouba	Shantou	Average	N	Cronbach alpha
Clan	2.8326	2.9717	3.0240	**3.2614**	2.3952	2.9391	182	0.79
Adhocracy	2.0088	1.8468	1.7070	1.7100	2.8590	1.9462	185	0.86
Market	3.2280	3.0319	2.1667	2.2105	**3.4102**	2.7084	171	0.88
Hierarchy	**3.5746**	**3.4667**	**3.5323**	3.0738	2.3513	**3.3441**	178	0.84
Respondents (N)	38	35	56	38	26			
Response rate %	37.6	39.3	47.5	37.2	48.1			

A total of 407 respondents from 98 first-class construction enterprises returned the questionnaire, i.e. the response rate is 21%. The valid number of responses is 363 from 66 enterprises and the result is that hierarchy culture with mean score of 3.9364 is the predominant culture (see Figure 3).

For cluster analysis to be carried out to classify the enterprises into groups that share similar organisation culture profiles across the four culture types, scores at the individual level for each type of culture need to be aggregated into the organisational (enterprise) level. However, as noted by some organisational scholars (e.g. Howe, 1986; Cooke and Rousseau, 1988; Zammuto, 1984), to use aggregated individual data for organisational-level analysis, there should be low within (group)-variation in the variable or perceptual agreement within group. Therefore, empirical support for such within-group (i.e. within-enterprise) agreement of perceptions has to be provided before aggregating the individual-level scores into organisational-level data. Hence, the eta-squared statistics (see Table 2), which measure within-group (unit) association/consistency, are checked and there is perceptual agreement by their employees within each of the Chinese enterprises.

Cluster analysis examines an entire set of interdependent relationships for the purpose of parsimony. To see whether there exists an underlying structure of Chinese construction enterprises (cases) across the four types of cultures (variables), non-hierarchical cluster analysis is applied to the data at the organisational level. In this particular analysis, the non-hierarchical clustering procedure starts from the smallest prespecified number of two clusters and ends at the number of six clusters. Multiple runs are first made until the stable solution for each specific number of clusters is obtained. The ideal number of clusters to be obtained should be such that there is as little variance within each cluster (group of enterprises sharing similar organisational culture) while there is much variance between the clusters. The F values, as the ratio of between-group variance and within-group variance for each type can be used as an indicator for identifying the optimal number of clusters, with an acceptable observed significance level being a *must* ($p<0.05$).



Note: Data based on means at individual level
(clan 2.9974; adhocracy 1.9062; market 2.4856; hierachy 3.9364)

Figure 3 Typical organisational culture profile of Chinese construction enterprises.

Table 2 Mean scores of culture scales in stage 2 major survey

Culture type	Mean scores	Cronbach alpha	Eta squared	F	Sig.
Clan	2.9974	0.88	0.791	17.312	0.000
Adhocracy	1.9062	0.80	0.761	14.564	0.000
Market	2.4448	0.89	0.849	25.696	0.000
Hierarchy	3.9364	0.87	0.629	7.734	0.000

Notes: Individual N=363; Enterprise N=66.

Although results of the three-cluster, four-cluster, five-cluster and six-cluster solutions all show an acceptable level of significance ($p<0.05$), comparisons between them make it obvious that the five-cluster solution is the most desirable, as the F values generally increase from the three-cluster solution through to the five-cluster solution and decrease in the six-cluster solution. Thus a five-cluster solution is selected as the final solution for this analysis. Table 3 lists the finalised five- and six-cluster membership and the number of enterprises included in each cluster.

Discussion

To attempt to represent organisational culture in four distinct types/profiles would be misleading. The four types adopted by Cameron and Quinn (1999) provide a basis to systematically organise culture variances at the organisational level but does not pretend to be comprehensive of all cultural phenomena—especially at national level. The framework of the four culture profiles supports a platform to interpret key elements of organisational culture that can foster change and improvement in organisations, i.e. a framework that provides an 'intuitively appealing and easily interpretable way to foster the process of culture change' (Cameron and Quinn, 1999, p. 17).

Findings from stage 1 of the five selected cases show that:

- cultural difference exists at the corporate level of Chinese construction enterprises;

Table 3 Stabilised final clusters with ANOVA results

Cluster / Culture type	5-cluster solution										
	1 N=18	2 N=5	3 N=22	4 N=8	5 N=13	Cluster mean square	df	Error mean square	df	F	Sig.
Clan	3.8037	4.0643	2.9768	2.3239	1.9435	8.867	4	0.038	61	232.476	0.000
Adhocracy	1.5153	3.2968	2.1224	2.2267	1.4488	4.241	4	0.044	61	97.383	0.000
Market	1.9387	4.1056	2.7011	3.8214	1.6607	10.629	4	0.029	61	370.397	0.000
Hierarchy	4.1412	4.1821	3.6983	2.9339	4.4321	3.371	4	0.044	61	76.652	0.000
	6-cluster solution										
	1	2	3	4	5	6					
Clan	3.0374	2.9040	4.0643	2.3239	1.9435	3.8037	7.113	5	0.037	60	191.424	0.000
Adhocracy	1.9934	2.2772	3.2968	2.2267	1.4488	1.5153	3.481	5	0.037	60	94.183	0.000
Market	2.7253	2.6720	4.1056	3.8214	1.6607	1.9387	8.506	5	0.029	60	294.165	0.000
Hierarchy	3.8802	3.4801	4.1821	2.9339	4.4321	4.1412	2.871	5	0.030	60	95.208	0.000

- of all the four culture types, hierarchy and clan are stronger than market and adhocracy.

This implies that, although there exist cultural differences at the corporate level, the Chinese traditional national culture, characterised by Confucianism and nurtured by decades of highly unified political ideology and centralised planned economy, has great influence at the corporate level. However, China's recent open and reform policy has been exerting an impact on its current culture, which can be reflected from the cultural traits in the Shantou Enterprise (Shantou is in the south of China and has been long exposed to Western market influence). The results reflect the general status of China's mixed and transitional characteristics, politically, socially and economically.

In stage 2, it is found from non-hierarchical cluster analysis that there are five salient clusters of organisational culture profiles among Chinese construction enterprises. There is a choice of two clustering procedures: hierarchical and non-hierarchical (also called '*k*-means' in SPSS). Both procedures have advantages and disadvantages. Although the non-hierarchical clustering results may depend on the order of observations in the data, this disadvantage can be eliminated by making multiple runs using different orders of cases to stabilise the solution with SPSS. Also, the *k*-means clustering procedure in SPSS makes it very easy to start from a pre-specified number of clusters (usually two) to as many clusters as the number of the objects (cases), making it likely to obtain the optimised solution (number of clusters) with proper criteria in consideration of the purpose of the research. There are no hard and fast rules on deciding the most appropriate number of clusters as the final solution; however, the *k*-means approach was adopted based on the following guidelines (see Malhotra, 1999): (a) theoretical, conceptual and practical considerations for the research purpose; (b) the meaningful size of the clusters; (c) the ratio of total within-group variance to between-group variance for the *k*-means procedure.

Of all the 66 enterprises in Table 3, 33% (22 enterprises) are in cluster 3 with a predominantly hierarchy culture; 27% (18 enterprises) are in cluster 1 with strong hierarchy and clan cultures but quite weak market and adhocracy cultures; 20% (13 enterprises) in cluster 5 which shows a very unbalanced culture profile with hierarchy being the only dominating type and the other three being quite weak; 12% (8 enterprises) are in cluster 4 which shows market culture being the dominant type and the other three types being moderate; 8% (5 enterprises) are in cluster 2 which shows a strong but also balanced culture profile, i.e. from a mean score of 3.2968 in adhocracy to 4.1821 in hierarchy.

Considering the traditional Chinese culture and the current status of the Chinese construction industry, the above general culture profile of the construction enterprises seems to be consistent with the particular Chinese context. Three important factors that shape the culture of an organisation have acquired the consensus of culture scholars, summarised by Brown (1998) as: (1) the societal or national culture within which an organisation is physically situated; (2) the vision, management style and personality of an organisation's founder or other dominant leader; and (3) the type of business an organisation conducts and the nature of its business environment. Hierarchy culture is the most dominant, which reflects 40 years of implementing the centrally planned economic system with the enterprises strongly focused on 'order'

and this hierarchy culture may have caused the widely criticised 'red tape'. The hierarchy culture leader functions as a monitor by ensuring that procedures are followed, collecting information on the performance of the subordinates and using technical knowledge to verify their performance (Maloney and Federle, 1991). The second dominating culture, clan culture, reflects the traditional Chinese culture that focused on 'harmony and *guanxi*' and 'people-orientation'. Leaders in a clan culture employ a concerned, supportive style that allows them to be mentor and facilitator (Maloney and Federle, 1991).

With the more recent 20 years of economic reform, there appears to be more and more competition in the Chinese construction industry which, in turn, leads to the market culture of some Chinese enterprises. The leader in a market culture is directive, goal oriented and emphasises short-term accomplishment and control of work process (Maloney and Federle, 1991). The very low score of adhocracy culture in the general culture profile suggests that innovation and risk-taking spirits are still relatively absent among Chinese construction enterprises.

According to Maloney and Ferderle (1991), the hierarchy culture is the antithesis of the adhocracy culture, and likewise, clan culture that of market culture. The objective for organisations is to develop characteristics of all four cultures because those that exhibit multiple (paradoxical) cultures tend to do well in many domains. At present, only five enterprises in cluster 2 exhibit a balanced culture.

To test the postulation that the relationship between organisational culture and effectiveness is reciprocal, the effectiveness outcome must be measured and its relationship with organisational culture examined. In order to investigate, in future research, if a particular culture profile (say, the balanced culture in cluster 2) is more effective than the others, the clusters of organisations (with different culture profiles) may be tested for comparison of their organisational effectiveness indicators by the Kruskal–Wallis test. Based on the model in Figure 2, the suggested variables for measuring effectiveness outcome are goal attainment and job satisfaction at the *individual level*, and quality service, economic return, growth and survival at the *organisational level.* These variables have to be operationalised and further research is to adopt the following approach: (1) an organisational effectiveness survey instrument to be developed for measuring performance effectiveness of the same enterprises in stage 2; the culture profiles from stage 2 to be mapped on to the effectiveness measures in order to analyse whether culture is a variable to explain the variance in organisational effectiveness; (2) adopt a qualitative research approach by means of selected case studies (from the various clusters) to identify specific culture variables which are contributory to their performance effectiveness; results of which would indicate future directions for research in organisational culture change.

Conclusion

This paper presents a theoretical framework developed for investigating the relationship of culture and effectiveness of organisations. Based on social cognition literature, the C-E model is underpinned by schema theory to posit that culture affects performance effectiveness through behaviours, i.e. schema are culture-embedded and affect the individual's behaviours towards performance.

Preliminary analysis of organisational culture profiles performed in the case of Chinese construction enterprises shows that the southern enterprise with most exposure to foreign investors adopts a market-oriented culture. The subsequent survey shows that there are five clusters of culture profiles, mostly hierarchical in nature. Hierarchies continue to emphasise maintaining stability, permanence and smooth operations while formal rules and policies comprise the organisational glue that binds the behaviours of members. Only one cluster shows a strong market culture that values goal clarification and prides itself on accomplishment. Further to this study, future research directions may focus on (1) performance effectiveness of the various culture clusters; and (2) the analysis of organisational change from hierarchy to market orientation.

Acknowledgement

This paper is supported by the Hong Kong RGC CERG project grant HKU7122/03E and partially by the HKU CRCG grant. This study is collaborative work between the University of Hong Kong and the Tianjin University under the China Network (http://hkusury2.hku.hk/chinanetwork/index.htm).

Notes

1. All large-scale Chinese contractors were state-owned enterprises which used to be operated by office bearers in government departments. Although the state officials now devolve from holding positions in the enterprises, the organisation structures of these enterprises practically remain unchanged.
2. According to *Administrative Regulations of Construction Enterprises* (Ministry of Construction, 1989), construction enterprises are categorised into four classes: first class,

second class, third class and fourth class. In the first-class enterprises, there are 29 sub-groups such as building (civil and industrial engineering), chemical and hydro engineering; highway and transportation engineering, of which building construction enterprises are the largest sub-group.

3. The newer issue of *Administrative Regulations of Construction Enterprises* (Ministry of Construction, 2001) updates the classification of the construction enterprises. The new 'top class and first class' is almost equivalent to the previous 'first class'. Survey for this research is based on the previous categorisation and data are mostly related to the enterprises that have undergone the more rapidly changing era of the 1990s.

References

Adams, J.S. (1965) Inequity in social exchanges, in Berkowitz, L. (ed.) *Advances in Experimental Social Psychology*, Academic Press, New York, pp. 267–300.

Atkinson, J.W. (1982) Old and new conceptions of how expected consequences influence actions, in Feather, N.T. (ed.) *Expectations and Actions: Expectancy Value Models in Psychology*, Lawrence Erlbaum Associates, Hillsdale, NJ.

Atkinson, J.W. and Birch, D. (1970) *Dynamics of Action*, Wiley, New York.

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

Brown, A. (1998) *Organizational Culture*, 2nd edn, Financial Times Pitman Publishing, London.

Calori, R. and Sarnin, R. (1991) Corporate culture and economic performance: a French study. *Organization Studies*, **12**, 49–67.

Cameron, K.S. and Quinn, R.E. (1999) *Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework*, Addison-Wesley, Reading, MA.

Carroll, D.T. (1983) A disappointing search for excellence. *Harvard Business Review*, **61**(6), 78–88.

China National Bureau of Statistics, Department of Investment and Construction Statistics (2002a) *China Statistical Year Book on Construction*, China Statistics Press, Beijing. 国家统计局固定资产投资统计司（2002a）中国建筑业统计年鉴. 北京：中国统计出版社.

China National Bureau of Statistics, Department of Investment and Construction Statistics (2002b) *The Chinese Major Construction Enterprises*, China Statistics Press, Beijing. 国家统计局固定资产投资统计司（2002b）中国大型建筑企业. 北京：中国统计出版社.

Cooke, R.A. and Rousseau, D.M. (1988) Behaviour norms and expectation. *Group and Organizational Studies*, **13**(3), 245–73.

Cooke, R.A. and Szumal, J. (1993) Measuring normative beliefs and shared behavioural expectations in organizations: the reliability and validity of the organizational culture inventory. *Psychological Reports*, **72**, 1299–1330.

Cooke, R.A. and Szumal, J. (2000) Using the organizational culture inventory to understand the operating cultures of organizations, in Ashkanasy, N.M., Wilderom, C.P.M. and Peterson, M.F. (eds) *Handbook of Organizational Culture & Climate*, Sage Publications, Inc, Thousand Oaks, CA.

D'Andrade, R.G. (1992) Schemas and motivation, in D'Andrade, R.G. and Strauss, C. (eds) *Human Motives and Cultural Models*, Cambridge University Press, Cambridge.

Deal, T.E. and Kennedy, A.A. (1982) *Corporate Cultures: The Rites and Rituals of Corporate Life*, Addison-Wesley, Reading, MA.

Denison, D.R. (1990) *Corporate Culture and Organizational Effectiveness*, Wiley, New York.

Denison, D.R. and Mishra, A.K. (1995) Toward a theory of organizational culture and effectiveness. *Organizational Science*, **6**(2), 204–23.

Etzioni, A. (1964) *Modern Organizations*, Prentice Hall, Englewood Cliffs, NJ.

Fiske, S.T. and Taylor, S.E. (1991) *Social Cognition*, 2nd edn, Addison-Wesley, Reading, MA.

Gale, A.W. (1992) The construction industry's male culture must feminize if conflict is to be reduced: the role of education as a gatekeeper to male construction industry, in Fenn, P. and Gamerson, R. (eds) *Construction Conflict Management and Resolution*, E & FN Spon, London.

Gordon, G.G. and DiTomaso, N. (1992) Predicting corporate performance from organizational culture. *Journal of Management Studies*, **29**, 783–98.

Gregory, K. (1983) Native view paradigms: multiple cultures and culture conflicts in organizations. *Administrative Science Quarterly*, **28**, 359–76.

Hall, M.A. and Jaggar, D.M. (1997) Should construction enterprises, working internationally, take account of cultural differences in culture? in Stephenson, P. (ed.) *ARCOM 97, Proceedings of the 13th Annual Conference*, Association of Researchers in Construction Management, Cambridge, pp. 1–10.

Harris, S.G. (1996) Organizational culture and individual sense-making, in Meindle, J.R., Stubbart, C. and Porac, J.F. (eds) *Cognition within and between Organizations*, Sage Publications, Thousand Oaks, CA.

Hitt, M.A. and Ireland, R.D. (1987) Peter and Waterman revisited: the unended quest for excellence. *Academy of Management Executive*, **1**(2), 91–8.

Hofstede, G. (1991) *Cultures and Organizations: Software of the Mind*, McGraw-Hill, London.

Hofstede, G. (1993) Cultural constraints in management theories. *Academy of Management Executive*, **7**(1), 81–94.

Hofstede, G., Neuijen, B., Ohayv, D.D. and Sanders, G. (1990) Measuring organizational cultures: a qualitative and quantitative study across twenty cases. *Administrative Science Quarterly*, **35**, 286–316.

Howe, J.G. (1986) Group climate: an exploratory analysis of construct validity. *Organizational Behaviour and Human Performance*, **19**, 106–25.

Hu, D. (2001) *On the Competitiveness of Enterprises*, Economic and Management Press, Beijing (in Chinese). 胡大力（2001）论企业竞争力. 北京：经济管理出版社 第243页.

Jaques, E. (1951) *The Changing Culture of a Factory*, Tavistock Publications, London.

Jaques, E. (1965) *The Changing Culture of a Factory*, Tavistock Publications, London.

Jones, M.O., Moore, M.D. and Snyder, R.C. (1988) *Inside Organizations: Understanding the Human Dimension*, Sage, Newbury Park, CA.

Kashima, Y. (1997) Culture, narrative, and human motivation, in Munro, D., Schumaker, J.F. and Carr, S.C. (eds) *Motivation and Culture*, Routledge, New York.

Kotter, J.P. and Heskett, J.L. (1992) *Corporate Culture and Performance*, Free Press, New York.

Kwan, A.Y. and Ofori, G. (2001) Chinese culture and successful implementation of partnering in Singapore's construction industry. *Construction Management and Economics*, **19**, 619–32.

Liu, A.M.M. (1999) Culture in the Hong Kong real-estate profession: a trait approach. *Habitat International*, **23**(3), 413–25.

Liu, A.M.M. (2003) The quest of quality in public housing projects: a behaviour-to-outcome paradigm. *Construction Management and Economics*, **21**(2), pp. 147–58.

Liu, A.M.M. and Fellows, R.F. (1999a) Culture issues, in Rowlinson, S. and McDermott, P. (eds) *Procurement Systems: A Guide to Best Practice in Construction*, E & FN Spon, London.

Liu, A.M.M. and Fellows, R.F. (1999b) The impact of culture on project goals, in Ogunlana, S.O. (ed.) *Profitable Partnering in Construction Procurement*, E & FN Spon, London.

Liu, A.M.M. and Walker, A. (1998) Evaluation of project outcomes. *Construction Management and Economics*, **16**, 209–19.

Lord, R.G. and Foti, R.J. (1986) Schema theories, information processing, and organization behaviour, in Sims, H.P. and Gioia, D.A. (eds) *The Thinking Organization: Dynamics of Organizational Social Cognition*, Jossey-Bass, San Francisco, CA.

Malhotra, N.K. (1999) *Marketing Research: An Applied Orientation*, 3rd edn, Prentice Hall, Upper Saddle River, NJ.

Maloney, W.F. and Federle, M.O. (1991) Organizational culture and management. *Journal of Management in Engineering*, **7**(1), 43–58.

Maloney, W.F. and Federle, M.O. (1993) Practical models for organizational assessment. *Journal of Management in Engineering*, **9**(1), 64–81.

Marcoulides, G.A. and Heck, R.H. (1993) Organizational culture and performance: proposing and testing a model. *Organizational Science*, **4**, 209–25.

Markus, H. and Zajonc, R.B. (1985) The cognitive perspective in social psychology, in Lindzey, G. and Aronson, E. (eds) *The Handbook of Social Psychology*, 3rd edn, Vol. 1, Random House, New York.

Marshall, S.P. (1995) *Schemas in Problem Solving*, Cambridge University Press, Cambridge.

Ministry of Construction (1989) *Administrative Regulations of Construction Enterprises*, Beijing (in Chinese).

Ministry of Construction (1996) *Regulations on Construction Enterprises Qualifications Management*, Beijing (in Chinese).

Ministry of Construction (2001) *Regulations on Construction Enterprises Qualifications Management*, Beijing (in Chinese).

Mitchell, T.R. (1983) The effects of social, task and situational factors on motivation, performance and appraisal, in Landy, F., Zedeck, S. and Cleveland, J. (eds) *Performance Measurement and Theory*, Lawrence Erlbaum Associates, Hillsdale, NJ.

Mullins, L.J. (1999) *Management and Organisational Behaviour*, Pearson Education Ltd and Prentice Hall, London.

Naylor, J.C., Prichard, R.D. and Ilgen, D.R. (1980) *A Theory of Behaviour in Organizations*, Academic Press, New York.

Newstorm, J.W. and Davis, K. (1993) *Organizational Behaviour: Human Behaviour at Work*, McGraw-Hill, New York.

Ouchi, W. (1981) *Theory Z: How American Business Can Meet the Japanese Challenge*, Addison-Wesley Co, Reading, MA.

Ouchi, W.G. and Jaeger, A.M. (1978) Type Y organization: stability in the midst of mobility. *Academy of Management Review*, **3**, 305–14.

Ouchi, W.G. and Johnson, J.B. (1978) Types of organizational control and their relationship to emotional well-being. *Administrative Science Quarterly*, **23**, 293–317.

Pascale, R. and Athos, A. (1981) *The Art of Japanese Management*, Simon & Schuster, New York.

Peters, T. and Waterman, R.H. (1982) *In Search of Excellence*, Harper and Row, New York.

Petty, M.M., Beadles, N.A.I.I., Lowery, C.M., Chapman, D.F. and Connell, D.W. (1995) Relationship between organizational culture and organizational performance. *Psychological Reports*, **76**, 483–92.

Pfiffner, J.M. and Sherwood, F.P. (1960) *Administrative Organization*, Prentice Hall, Englewood Cliffs, NJ.

Quinn, R.E. and Rohrbaugh, J. (1983) A spacial model of effectiveness criteria: towards a competing values approach to organisational analysis. *Management Science*, **29**, 363–77.

Robbins, S.P. (1996) *Organizational Behaviour*, 7th edn, Prentice Hall International, Inc, Englewood Cliffs, NJ.

Rousseau, D.M. (1990) Normative belief in fund-raising organizations: linking culture to organizational performance and individual response. *Group and Organizational Studies*, **15**, 448–60.

Rowlinson, S. and Root, D. (1996) The impact of culture on project management: a final report. Unpublished working report, Department of Real Estate and Construction, University of Hong Kong.

Rumelhart, D.E. (1984) Schemas and the cognitive system, in Wyer, R.S. and Srull, T.K. (eds) *Handbook of Social Cognitions*, Vol. 1, Lawrence Erlbaum, Hillsdale, NJ.

Schein, E.H. (1985) *Organizational Culture and Leadership: A Dynamic View*, Jossey-Bass Inc., Publishers, San Francisco, CA.

Schein, E.H. (1992) *Organisational Culture and Leadership*, Jossey-Bass, San Francisco, CA.

Seymour, D. and Rooke, J. (1995) The culture of the industry and the culture of research. *Construction Management and Economics*, **13**, 511–23.

Sha, K. and Lin, S. (2001) Reforming China's construction state-owned enterprises. *Building Research and Information*, **29**(4), pp. 270–6.

Silverzweig, S. and Allen, R.F. (1976) Changing the corporate culture. *Sloan Management Review*, **17**(3), pp. 33–49.

Strauss, C. (1992) Models and motives, in D'Andrade, R.G. and Strauss, C. (eds) *Human Motives and Cultural Models*, Cambridge University Press, Cambridge.

Taylor, S.E. and Crocker, J. (1981) Schematic bases of social information processing, in Higgins, E.T., Herman, C.P. and Zana, M.P. (eds) *Social Cognition: The Ontario Symposium*, Vol. 1, Erlbaum, Hillsdale, NJ.

Vesson, M.A. (1993) *Cultural Perspectives on Organizations*, Press Syndicate of the University of Cambridge, Cambridge.

Vroom, V.H. (1964) *Work and Motivation*, Wiley, New York.

Vroom, V.H. (1995) *Work and Motivation*, Jossey-Bass Publishers, San Francisco, CA.

Wilderom, C.P.M., Glunk, U. and Maslowski, R. (2000) Organizational culture as a predictor of organizational performance, in Ashkanasy, N.M., Wilderom, C.P.M. and Peterson, M.F. (eds) *Handbook of Organizational Culture & Climate*, Sage Publications, Inc, Thousand Oaks, CA.

Yao, B. (1998) *Construction Management*, China Construction Industry Press, Beijing.

Zammuto, R.F. (1984) A comparison of multiple constituency models of organizational effectiveness. *Academy of Management Review*, **9**, 606–16.