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EARLY VIEW

# **NATIONAL CULTURAL DIMENSIONS AND THEIR IMPACT ON CONSTRUCTION PROJECT MANAGEMENT IN DEVELOPING COUNTRIES: THE CASE OF GHANA**

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## **Abstract**

Construction project management (CPM) in developing countries (DCs) tends to experience high levels of failures. These failures have been attributed to technical, behavioural and economic factors. However, in an increased globalised world, understanding cultural dimensions and their impacts has become essential for effective CPM. This study examines the extent to which national cultural dimensions (NCDs) explain CPM in DCs. Six dimensions that were identified from the review were used in a survey of 140 project management (PM) experts. Using exploratory and confirmatory factor analysis, a scale was obtained and validated through structural equation modelling. The results reveal that the level of inequality and the orientation of a developing country with respect to time are able to significantly predict CPM in these countries. This study draws managerial attention to how different cultural dimensions and collaboration among project team members impact CPM. The value of this research lies in the creation of a model that contributes to the understanding of CPM in DCs from the cultural perspective. This will help project managers to properly devise ways of dealing with cultural misunderstandings, which will eventually lead to appropriate approaches to CPM in these countries.

**Keywords:** construction project management, national cultural dimensions, structural equation modelling

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## INTRODUCTION

National culture (NC) and its dimensions have been a primary focus of sociology, psychology and anthropology since their inception (Kivrak et al., 2009). However, the parallel trend towards the running of business through projects has brought the attention of academics and project management (PM) practitioners to the study of national cultural dimensions (NCDs) and their role in PM.

Due to the growth of globalisation, the issue of how to successfully manage project team members with different cultural dimensions will never likely be settled easily. For example, research shows that 92% of project team members believe that different cultural dimensions exist in their teamwork, 60% think that these cultural dimensions impact on PM, and 83% believe that the impact of the NCDs is relevant to their performance as project team members (Tian, 2020). Therefore, construction project managers who work with global teams must be aware of the more diverse and complex challenges associated with the internationalisation of construction project management (CPM), such as differences in NCDs of the project team, project stakeholders who live in different time zones, unclear requirements caused by different native languages, and host country-specific political, economic and legal environment (Perkins et al., 2019).

Given that CPM activities are made by people (rather by other socio-technical resources)—who are very much influenced by their values and beliefs—no CPM activity can be entirely culture-free. Differences in NCDs call for differences in CPM practices, the failure of which could create serious barriers to CPM success (Kaminsky, 2019; Bredillet et al., 2010). Construction project managers need to understand the different NCDs within their team and manage them effectively because they are functions of differences in societal values (Goel et al., 2020).

Many developing countries (DCs) experience high levels of CPM failure (Borkor, 2011). The reasons for these failures are often attributed to a wide range of factors, including delays in payment, partisan politics, bureaucracy, corruption, poor supervision and lack of commitment by project leaders, poor planning, and change in government (Owusu-Ansah and Louw, 2019). These factors are somewhat embedded in cultural values (Venter, 2005), which makes culture a critical dimension that requires further investigation.

Even though some studies have analysed the impact of culture on some management aspects of the construction industry in DCs, only a few of them have

actually investigated the impacts of NCDs on CPM as a holistic concept in DCs. In addition, most of the existing works on the impact of NCDs on CPM are based in Western and developed countries. However, many management concepts may be wholly or partially inapplicable and irrelevant to other cultures in DCs. In this regard, the belief that Western-oriented techniques of CPM are just straightforward procedures that anyone can learn and implement (Turner and Muller, 2003) is problematic and creates a knowledge gap because in practice there have been considerable cross-cultural problems in using Western-oriented techniques of CPM in non-Western Countries (Gladstone and Karim, 2020).

Given the current changing and globalised business environment, understanding NCDs and their impacts on CPM as a holistic concept has become essential for efficient CPM, especially for DCs because only few studies have been conducted on this subject in this context. This study intends to address this gap by (1) conceptualising NCDs; (2) determining which of the dimensions best describes our selected DC (i.e., Ghana); (3) developing a valid instrument with an appropriate scale for NCDs and how they influence CPM in DCs; and, based on these, (4) draw policy guidelines with a special focus for DCs.

The remainder of this paper is structured as follows. Following the introduction, we present the theoretical underpinnings that sustain our theoretical model. The data collection and the methodology that we used to analyse the results will then be described. The results are presented next. This paper concludes with a discussion of the findings, as well as a description of the implications and avenues for future research.

## **THEORETICAL UNDERPINNINGS AND HYPOTHESES DEVELOPMENT**

Every circumstance that involves project management relies on the planning, organising, inspiration, and control of resources to achieve specific objectives. This essentially means that both the results that are attained and the resources that are used to obtain the former will determine how successfully a project is managed (Kuchta and Sukpen, 2013). Regardless of a project's goals, there is one critical aspect that is worth to be considered: projects are managed within a specific national cultural context. In the subsections that follow, we will provide an overview of this construct (national culture), its dimensions, and how they apply in the context of construction projects.

### **National Culture**

Culture can be defined as the way in which a group of people solves problems and reconciles dilemmas (Schein, 1985). Taking this definition as a starting point, it can be argued that NC is a particular pattern of thinking and acting that is espoused by people in a society, modelled around collective values, beliefs,

symbols and practices, and inherently different from the systems of other groups of people and societies (Kuchta and Sukpen, 2013). National culture may be construed to represent a phenomenon of immense complexity in that it seeks to articulate the understanding of society. However, for the purposes of this study, when a group of people exist for quite an amount of time and have strong elements (e.g., common language, mass media, educational and political systems, etc.) to affect a common mental programming of its citizens, then we say they have the same national culture (Ojiako et al., 2012; Hofstede, and Minkov, 2010). Again, this research takes a population living in a country and sharing similar backgrounds, ideas, norms, beliefs and values as a population from the same national culture (Owusu Ansah and Louw, 2019).

The culture of a nation manifests in a number of ways (Ankrah et al., 2009; Hofstede et al., 2010), from the invisible and sometimes unconscious actions (e.g., values, beliefs and underlying assumptions) to very visible and tangible manifestations (e.g., artefacts, creations and behaviour norms or symbols, heroes and rituals).

### **National Cultural Dimensions and Construction Project Management**

The dimension of a nation's culture involves the effects that the nation's culture has on the values of its members and how these values relate to behaviour (Hofstede et al., 2010). In their 'Globe Study', House et al. (2014) found performance orientation, assertiveness orientation, future direction, humane orientation, institutional collectivism, in-group collectivism, gender egalitarianism, power distance and uncertainty avoidance as dimensions of a nation's culture. However, Schwartz (1994) discovered conservatism, hierarchy, mastery, effective autonomy, intellectual autonomy, egalitarian commitment, and harmony as components of NC. Lewis (2012) classified NC into three dimensions namely: linear active, multi-active, and reactive.

Walker (2015) provides a comprehensive definition for CPM as the planning, control and coordination of a project from its conception to completion (including commissioning) on behalf of a client. This definition focuses on the identification of the client's objectives in terms of utility, function, quality, time and cost, and the establishment of relationships between resources. The integration, monitoring and control of the contributions to the project and their output, and the evaluation and selection of alternatives in pursuit of the client's satisfaction with the project outcome are fundamental aspects of CPM (Barnes, 1988). The main difference between CPM and construction management is the scope. CPM is a broader discipline that involves supervising all of the parts of a construction project, from the initial design to the final product, while construction management involves overseeing a construction project. Consequently, construction project managers oversee the entire process of a construction

project, which includes meeting with the client to discuss the initial plans, hiring a team and managing construction documents, creating and implementing the project budget, collaborating with project stakeholders and overseeing the construction team, including the construction manager (Barnes, 1988; Shadan and Fleming, 2012). To be successful, construction project managers need to have conceptual, human, technical, and negotiating skills (Goodman, 1993). Meanwhile, construction managers, who often work at a construction site, supervise the construction stage of a project by ordering construction materials, managing and delegating tasks to the construction team, collaborating with subcontractors, and checking for quality and safety during the construction process. In this regard, they are in need of technical skills (Shadan and Fleming, 2012; Goodman, 1993).

The academic literature has demonstrated that NCDs have major impacts on CPM practices (Kivrak et al., 2009). For example, the studies of Kuchta and Sukpen (2013) observed that construction projects are implemented by persons and in societies. These persons and societies have certain thoughts and mind-sets, which influence whatever they do. Therefore, any factor which might seem important in the CPM process is ultimately influenced by the concept of NCDs. Consequently, some cultural studies in Africa, such as those of Ankrah et al. (2009), have argued that any organisation that wanted to manage construction project successfully in another country has to clearly understand the cultural dimensions of the host country. In the same context, when examining the impact of national culture and project success in Nigeria, Ojiako and Chipulu (2014) found that national culture can impact on a range of interests in construction projects, including how the performance of the projects may be measured, the perception and acceptance of risk in the project planning, and the individuals who play active roles in the CPM profession. Not surprisingly, several studies find support to the argument that NCDs do have an impact on CPM, specifically on planning and control (Rodrigues et al., 2014), as well as the management of construction teams, leadership, trust and communication (Rees-Caldwell and Pinnington, 2013).

According to Tung and Verbeke (2010), Hofstede's (1980) pioneering study of NCDs was conceived as a cutting-edge tool for the cross-cultural analysis of international business and CPM. Hofstede (1980) found that factors such as power distance, individualism vs collectivism, masculinity vs femininity, uncertainty avoidance, time orientation and indulgence vs restraint were the dimensions of NC. The following section will elaborate on each of these dimensions and their impact on CPM.

### **Power Distance (PD)**

According to Hofstede (2001), PD refers to the extent to which the less powerful members of institutions and organisations within a country expect and accept

that power is distributed unequally. In a high PD culture, power distribution inequality is anticipated and admitted by the less powerful individuals of that society. Individuals in these societies admit a hierarchical order and they accept inequality in power, decision making, privileges, initiating actions, supervision, control and judgment, as permanent roles that are difficult to change (Hofstede et al., 2010).

Nations with high PD cultures have employees who are quite reluctant to air their grievances and disagreements with their seniors, which negatively affects CPM. Meanwhile, CPM is based on fairly decentralised structure that favours high project manager's authority and control over budget and resources, with a focus on formal and informal communication. CPM is also expected to promote changes in consultative management and the roles in accordance with the needs of the project's objectives. The resolutions of relationships, interpersonal and professional issues need to be clearly written down as procedures to avoid potential power abuse. Thus, CPM is expected to be more successful in lower PD nations than in high PD countries (PMI, 2017; Bredillet et al., 2010). Therefore, our first hypothesis states:

H<sub>1</sub>: PD significantly predicts CPM in DCs.

### **Individualism vs. Collectivism (IVC)**

Individualism vs. collectivism (IVC) describes the extent to which one's identity is derived from one's self as opposed to the group of which the individual is a member (Hofstede, 1980). Societies with a high score of individualism are mostly constructed of people who are expected to have attention for themselves and their close relatives. However, collective societies have strong bonds within (Hofstede et al., 2010). An absolute loyalty within a circle of relatives and a specific group of community members is possible (de Waal and de Boer, 2017).

CPM relies on the pre-defined roles and competencies of the project team members. Therefore, it considers the collectivist relationship among team members as relevant. The complementarity and accountability of project team are essential to ensure the time, cost, schedule paradigm (Phua and Rowlinson, 2004). Even though each team member is directly and individually responsible for the completion of their part of the job, the unity, networking and communication among team members is vital for effective CPM (Shore and Cross, 2005). c:

H<sub>2</sub>: IVC significantly predicts CPM in DCs.

### **Masculinity vs. Femininity (MVF)**

Masculinity vs. femininity (MVF) seeks to bring out the discernible gender considerations in different NCs. According to Hofstede et al. (2010), a highly

masculine culture tends to encourage assertiveness and competitiveness in individuals and within social groups. Masculine societies are more achievement-oriented and heroic. In contrast, feminine-oriented cultures value quality of life, where people and their environment are actually very important matters of concern (Hofstede, 1980).

According to the PMI (2017), PM approaches usually offer a framework that supports the adequate management of human resources (e.g., interpersonal relationships, issues resolution, team-building activities, ground rules, recognition and rewards, etc.) that may be impacted on by gender roles divergence (masculinity) or convergence (femininity) in a country. Construction projects can be implemented in adequate environments that comply with the underlying dimension pole (masculinity or femininity) of the country. Therefore, CPM is expected to be effective independent of the masculine or feminine dimension of a nation (Bredillet et al., 2010). Thus, our third hypothesis states:

H<sub>3</sub>: MVF does not significantly predict CPM in DCs.

### **Uncertainty Avoidance (UA)**

Uncertainty avoidance (UA) refers to the extent to which the members of a culture feel threatened by unknown situations. It involves the extent to which a nation embraces novelty and emphasizes structures and rules (Hofstede et al., 2010). What matters here is how the members of the society feel about the uncertainty of the future (de Waal and de Boer, 2017). Therefore, the UA score should inform us about the level of anxiety of a country. A low index indicates a low feeling of being threatened by uncertainties, and a high index indicates the contrary.

Project team members from nations with high UA culture usually seek clarity and order in activities that they are assigned because they usually want to avoid the anxiety and stress that are associated with uncertain and risky situations (Hofstede, 2001). However, project team members from low-UA cultured nations view uncertainties as being inherent in life and thus take each day as it comes. They are very pragmatic in the way in which they handle issues and are flexible to organisational changes, leading to effective CPM and execution (Ojiako et al., 2014). Thus, our fourth hypothesis states:

H<sub>4</sub>: UA significantly predicts PM in DCs.

### **Time Orientation (TO)**

Time orientation (TO) refers to the extent to which countries give precedence to heritage or prioritise present and the future. Long-term orientation holds a pragmatic future-oriented perspective and stresses persistence, thrift, shame, and



status in the long run (Hofstede et al., 2010). However, short-term orientation has a conventional historical short-term point of view and stresses calm, protection of face, and respect for tradition and rituals (Hofstede, 1980).

Project team members from short term orientation cultures are strongly concerned with the establishment of absolute truth and are normative in terms of their thinking (Hofstede et al., 2010). These employees show enormous respect for traditions and focus on attaining rapid results with a comparatively small propensity of saving for the future (Ojiako et al., 2014). Given that most construction project are time bound and are expected to meet higher quality standards within these stipulated times, it is expected that the orientation of the project team members with respect to time is relevant in the quest to achieve effective CPM (Yen and Pulatov, 2007). Thus, our fifth hypothesis states:

H<sub>5</sub>: TO significantly predicts CPM in DCs.

### **Indulgence vs Restraint (IVR)**

In societies with high scores for indulgence, the satisfaction of basic human needs is welcomed and seen as a joyful act (Hofstede et al., 2010). However, for societies with high levels of restraints, gratification is suppressed and controlled by rigid rules (de Waal and de Boer, 2017).

According to Ojiako et al. (2014), project team members who have a culture of indulgence generally possess a positive attitude and have a tendency towards optimism than employees with restraint orientation. In addition, indulgence-oriented employees emphasise leisure, act as they please and spend money as they wish (Hofstede et al., 2010). Nguyen and Watanabe (2017) observed that insofar as they have the required competence and are committed to achieving the CPM target, the orientation of the project team with respect to how they live their life (indulgence or restraint) outside the project-oriented organisation is not a major consideration for the project manager. Thus, our sixth hypothesis states:

H<sub>6</sub>: IVR does not significantly predict CPM in DCs.

### **Modelling the Construct NCDs**

Following his first publication on dimensions of culture in the 1980s, Hofstede et al. (2010) provided an updated version of his multidimensional cultural model, based on which the culture of various countries could be studied and compared. However, Hofstede's model has received some criticism. For example, McSweeney (2002) suggested that Hofstede's proposal of treating countries as cultural units is a flawed assumption. He also argued that Hofstede's dimensions did not reflect differences in NC but reflected differences in company or organisational culture. Criticisms also arise from a methodological point of view.

According to Ailon (2008), Hofstede relied on quantitative methods to develop his dimensional structures. This approach for reducing culture to simple numbers and causal factors reduced the complexity of NC to a scale.

Despite these criticisms, Salter et al. (2013) recognised that Hofstede's framework has frequently been used, mainly because of its simplicity, identification of dominant themes and understanding of cultural changes. Hofstede's framework largely remains pivotal in studies focused on NC. Arguably, Hofstede's model is not just the most widely-cited and used in cross-cultural management research—with application in a variety of subfields (Owusu-Ansah, 2019)—but it is also the most validated (Ojiako et al., 2014).

In light of this review, we consider that Hofstede's NCDs have enough support to be used in this study to examine the impact of NCDs on CPM in DCs. To conclude this section, Table 1 provides a summary of the dimensions of NCDs that have been considered in the literature and which the authors have investigated.

Table 1. Literature map of dimensions of NCDs by various authors.

Authors								
	Cultural Dimensions							
	Lewis (2012)	Hofstede et al. (2010)	Trompenaars (1997)	Schwartz (1994)	Hall (1999)	Muller and Turner (2004)	House et al. (2004);	Shore and Cross (2005)
Power distance		•					•	•
Individualism vs Collectivism		•					•	•
Uncertainty avoidance		•					•	•
Masculinity vs Femininity		•	•				•	
Time orientation		•					•	•
High context vs Low context communication					•			
Openness to change				•				
Self-transcendence to self-enhancement				•				
Linear active	•							
The multi-actives	•							
The reactive	•							
Embeddedness vs. Autonomy				•				

Hierarchy vs. Egalitarianism		•		
Mastery vs. Harmony		•		
Universalism vs. Particularism	•			
Internal control vs. External control	•			
Affective vs. Neutral	•			
Individualism vs. Communitarianism	•			
Achieved status vs. Ascribed status	•			
Specific vs. Diffuse	•			
Time as sequence vs. Time as synchronization	•			
Integration			•	
Confucian work dynamics			•	
Human heartedness			•	
Moral discipline			•	
Performance orientation			•	•
Humane treatment			•	•
Family collectivism			•	
Assertiveness			•	
Indulgence vs Restraint	•			

## The Ghanaian Context

Ghana is a DC that is faced by many CPM challenges, both technical and non-technical. Empirical studies on CPM in Ghana have concluded that while projects in general have experienced challenges regarding implementation and consequently success, construction projects in particular are undermined by a unique set of challenges (Ahadzie et al., 2012). In addition, Venter (2005) discovered that Ghana's track record of CPM has been very poor. These failures have exacerbated the very characteristics of under-development that these projects were meant to ease. Some examples of projects that have not been successfully executed (Republic of Ghana Budget, 2017) include Accra Plains Irrigation, the Affordable Housing Units projects, Coastal Fishing Harbours and Landing Sites, Tema-Akosombo-Buipe Multi-Modal Transportation, Western Corridor Gas Infrastructure, Western Corridor "Oil Enclave" Road Re-Development, Western Railway Line Modernization, Takoradi Port Rehabilitation, and Sekondi Industrial Estate—based on which the government of Ghana borrowed US\$3.0 billion from the China Development Bank (CDB) and US\$547 million under the Millennium Challenge Account (MCA).

Other strategic projects that have failed include the Ghana-STX Building Project, which was a \$10 billion housing project which involved the construction of 200,000 houses in the country in five years (Okereke, 2017; Owusu, 2012), and the Savannah Accelerated Development Authority afforestation project, in which a dual carriageway that was estimated to cost GH¢ 73 million rose to GH¢100 million at completion due to challenges that led to delay and cost overrun (Amoatey and Ankrah, 2017).

A review of 65 construction projects in 10 educational institutions in Ghana revealed that only five were completed within their stipulated time, while the rest exceeded their scheduled date (Famiyeh et al., 2016). Within this same context, Skinner (2020) reported that US\$360 million that was spent on building boreholes and wells in deprived areas in Africa became useless because these projects were not maintained when they broke down. This study also suggests that 58% of water points in northern Ghana are not functioning, even though the citizens in those areas are struggling with access to portable water.

In their quest to understand the challenges associated with CPM in Ghana, Ahadzie et al. (2012) found that cultural issues related to deferment, hierarchy, notions of respect, taboos and other aversions often impact CPM negatively. Supporting this pronouncement, Damoah and Akwei (2017) mentioned that the Ghanaian culture is a major factor for the failure of many construction projects in the country. Some features of the Ghanaian culture (e.g., their perception of time, the way they take initiative, the level of power distance, the diffused nature of their culture, their status by position nature, and the particularism nature of their

culture) significantly impacted the management of construction projects in the country (Teng, 2016). It is worth noting that these cultural issues are not specific of Ghana but are shared by many DCs (Owusu-Ansah and Louw, 2019).

Ofori (2013) argued that conducting a study to determine the success or otherwise of construction project delivery in a developing economy like Ghana would require the phenomenon to be investigated within the context of different situations defined by the national cultural framework of the country. Nevertheless, Damoah and Kumi (2018) highlighted that even though few studies exploring the role of NCDs in CPM exist, there are still many issues to be addressed to provide useful guidelines that are required to successfully complete a construction project in Ghana, which is true for many DCs. On the basis of these recommendations, the context of this study considers the case of Ghana.

## **DATA AND METHODOLOGY**

### **Data Collection and Sample**

To obtain the responses of project managers on how NCDs influence CPM in DCs, a survey was designed and targeted at certified PM practitioners who are members of the PMI in Ghana, which gave a total of 228 (PMI-Ghana, 2018). The profile of the survey participants includes project managers who are serving in various capacities, such as government officials, heads of public and private institutions, and civil servants who give project contracts, contractors and managers, managers of project oriented non-governmental organisations and employees of project oriented organisations, and others who are certified project managers in Ghana. Using Sekaran's (2009) probability sampling table, a total of 140 PM practitioners were selected for the survey using the purposive sampling technique (Tongco, 2007). The survey was administered to the executives of the PMI, Ghana for onward distribution to their members on 19 January 2020. This was done after a request letter was sent to explain the purpose of the study and ask for their acceptance to participate in the survey. A positive response from the PMI was received on 16 January 2020. In all, 140 surveys were distributed and 124 were returned (representing a response rate of 88.6%). From these, 112 were duly completed without errors and were valid for the analysis.

### **Measures**

The survey that was distributed to the PM experts was designed using the English language and was divided into two parts. The first part has five items and requested for demographic information about the respondents. This part was made up of a mix of open and closed ended questions, and was self-developed by the authors. The second was made up of six dimensions (i.e., the NCDs discussed under the theoretical underpinnings) with 24 items and six additional

items for the dependent variable, making a total of 35 items. A 5-point Likert scale, with 1 representing “strongly disagree to 5 representing ‘strongly agree’, was used to ask the respondents to express their level of agreement or otherwise to statements made with the selected items.

The scale that was used in the second part of the survey was self-developed by the authors using the NCDs proposed by Hofstede et al. (2010). The items that were used to operationalise the factors in this study were deduced from the descriptions given to the factors in the review section, with a justification for the selection of these factors and determinants. Table 2 shows the deduced dimensions and their respective items that emerged from a comprehensive review.

Table 2. List of dimensions and items

<b>Dimension</b>	<b>Item</b>	<b>Description</b>
Power distance	PD1	The superiority of superiors is accepted in my society.
	PD2	All individuals are not treated the same in my country.
	PD3	Individuals admit a hierarchical order in my country.
	PD4	In my society, each person's place is determined, and there is no need for an explanation for this placement.
Individualism vs collectivism	IVC1	My identity is derived from myself.
	IVC2	The degree of interdependence my society maintains among its members is low.
	IVC3	The group I belong to does not define me.
	IVC4	Individuals in my society pay attention to themselves and to their close relatives.
Masculinity vs femininity	MVF1	My society emphasise assertiveness.
	MVF2	In my society success is measured by the winner.
	MVF3	My society is driven by competition.
	MVF4	My society is achievement-oriented.

Uncertainty avoidance	UA1	There is discomfort of the individuals from my community against ambiguity.
	UA2	My society does not embrace novelty.
	UA3	People have strong norms on faith and reject unconventional conduct.
	UA4	In my society people value morals more than practice.

Table 2 (continued). List of dimensions and items

Dimension	Item	Description
Time orientation	TO1	My society shows no pragmatic future-oriented perspective.
	TO2	In my society there is respect for traditions and rituals.
	TO3	In my society education is not supported in preparation for the days to come.
	TO4	My society holds a conventional historical short-term point of view.
Indulgence vs restraint	IVR1	In my society satisfaction of basic human needs is welcomed.
	IVR2	Gratifications are not suppressed in my country.
	IVR3	Natural human drives related to enjoying life and having fun are welcomed in my society.
	IVR4	There are no rigid rules controlling gratifications in my society.

## Method

To identify the behaviour of the variables of interest, for the purpose of this study, the kind of questions that were posed to respondents required the use of quantitative approaches, with their subsequent experimental designs. Since the



items included in the survey were adapted from different previous works, in the first step it was necessary to examine the content validity of the data obtained through the content validity ratio. This implies testing how suitable our data were for factor analysis. Consequently, the Kaiser-Meyer-Olkin test and the Bartlett's test of sphericity were carried out (Ayre and Scally, 2014; Lawshe, 1975). Next, a principal component analysis was used as an exploratory tool to assist us in the grouping of the items that were included in the survey into factors. These analyses were performed using SPSS for Windows v25. To ensure an overall consistency of our measures, the reliability analysis of the factors obtained was vouched for using Cronbach's alpha and composite reliability (Fornell and Larcker, 1981). By assessing if the inter-factor correlations were less than the square root of the average variance extracted (AVE), the discriminant validity analysis among these factors was conducted using standardised covariances between factors to help ascertain the overall accuracy of our measures (Fornell and Larcker, 1981).

A definitive scale consisting of the new dimensions was obtained from the exploratory analysis and confirmed. To ascertain the fitness of the established definitive dimensions, structural equation modelling (SEM) was conducted using the robust maximum likelihood method from the asymptotic variance-covariance matrix (Bentler, 2006). These analyses were performed using the EQS 6.4 software for Windows.

## RESULTS

The preliminary analysis began with an exploration of the demographic characteristics (Table 3) of the respondents who participated in the survey. The idea is to provide the stakeholders with a basis for decision making and further subset analysis. The statistics highlight the dynamics embedded in our sample size and the sufficiency of our scale, thus throwing more light on the validity and the reliability of our data.

To validate the suitability of our data for factor analysis, the Kaiser- Meyer-Olkin test and the Bartlett's Test of Sphericity (Table 4) were performed. The results provided a Kaiser-Meyer-Olkin test value of 0.684, which is greater than the threshold value of 0.60. This indicates a good sampling adequacy and that the data are suitable for factor analysis. The Bartlett's test of sphericity was also positive and significant at 0.05 (i.e.,  $\chi^2 = 988.024$ ,  $df = 276$ ,  $p = 0.000 < 0.05$ ). These results authenticate a linear dependence among the variables and confirm that the database is good for further analysis (Pallant 2010).

Table 3. Demographic characteristics of the sample

	Number	%
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<b>Gender</b>		
Male	91	81.3
Female	21	18.8
Total	112	100

  

<b>Age</b>		
18-20	18	16.1
21-31	64	57.1
31-40	19	17.0
41-50	10	8.9
> 50	1	0.9
Total	112	100

  

<b>PM Certification</b>		
PMP	72	64.3
CAPM	21	18.8
PMI-RMP	8	7.1
PMI-PBA	6	5.4
OTHER	5	4.5
Total	112	100

Table 4. Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity

<b>KMO and Bartlett's Test</b>		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.784
Bartlett's Test of Sphericity	Approx. Chi-Square	988.024
	df	276

	Sig.	0.000
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An exploratory factor analysis (EFA) using principal components analysis and varimax rotation was launched to validate the factor structure of the measurement variables before the questions for this study were addressed. The exploratory analysis used 24 items from the determinants for the dimensions of NC. The scale that is used in this study was analysed in accordance with those criteria set by Ladhari (2012) to retain items. The criteria were that the items (a) loaded at 0.66 or more on a factor, (b) did not load at more than 0.50 on two factors, (c) had an item-to-total correlation of more than 0.50 and (d) had an eigenvalue larger than 1. In total, nine factors emerged from our analyses with eigenvalues greater than 1 (Kaiser, 1960). Table 5 summarises the EFA results. Even though nine factors emerged from our analyses with eigenvalues greater than 1, only five were selected because all of factors that retained only one item of the original dimension were discarded. The five selected factors that emerged from the EFA together accounted for 50.62% of the variance in the sample. Table 5 shows these five selected factors with loads greater than 0.66 highlighted. New (definitive) labels are proposed, although relatively few overlaps with original dimensions are shown.

Table 5. Matrices of the components extracted from the EFA

	<b>EFA (24 ITEMS)</b>				
	1PD	2TO	3IVR	4IVC	5MVF
PD1	.871	-.045	-.075	-.065	.164
PD3	.831	.017	-.044	.084	.032
PD2	.765	-.137	.094	-.101	.180
UA4	.653	-.128	.455	.113	.144
UA1	.593	.007	.131	-.027	-.155
TO3	.042	.822	.031	-.090	.045
TO2	-.176	.814	.025	.004	.116
TO1	-.214	.790	-.299	-.021	-.090
TO4	.099	.787	.075	-.056	-.057
IVR4	.006	.126	.675	-.030	-.203
MVF2	.017	-.114	.658	-.031	.310
IVC4	.551	-.020	.641	.061	-.013
IVC3	-.065	-.082	.552	.279	.132
IVC1	-.053	-.055	.077	.915	.020
IVC2	.050	-.079	-.001	.908	-.019
MVF3	.151	-.036	-.089	-.105	.760
MVF4	.167	.103	.267	.132	.699
IVR3	-.028	-.065	.039	-.040	.108
UA3	.418	-.096	.285	.222	.194
PD4	.268	-.002	.003	.022	.067
IVR1	.031	-.049	-.108	-.067	-.136

MVF1	.177	-.045	.250	.089	.300
IVR2	-.110	-.007	.047	-.086	-.172
UA2	-.410	-.057	.268	.027	-.179
% of variance	15.52	11.25	9.40	7.88	6.58

*PD* explained 15.52% of the variance of the 24 items, and assesses the level of equality or otherwise in DCs and how individuals in DCs admit a hierarchical order. The factor retained three out of the four original items in this dimension (PD1, PD3 and PD2) and included an additional item that was previously under another dimension (UA4). The level of the value placed on morals more than practice in DCs clarifies why it has been realigned to this dimension.

*TO* retained all of the four items of this original dimension (PD1, PD2, PD3 and PD4) and explained 11.25% of the variance. It assesses how DCs hold either a pragmatic future-oriented or a conventional historical short-term point of view.

*IVR* was composed of three different original items of the dimension (IVR4, MVF2 and IVC4). It accounted for the 9.40% of the variance. It assesses how social gratifications are accepted.

*IVC* retained two items out of the four of the initial dimensions (IVC1 and IVC2) and extracted 7.88% of the variance of the 24 items of the EFA. It measures how individuals identify themselves in their society.

*MVF* was composed of the two original items of this dimension (MVF3 and MVF4). It captured 6.58% of variance of the EFA. This dimension measures how assertive, achievement oriented and competitive a DC is.

It is notable that there were some few overlaps in the items of these original dimensions, and as a result some slight adjustments to the labels were made. The adjustment of items between original dimensions was done in consistency with the definitive dimension contents. Five factors were obtained, with one of the original dimensions being removed at this point. Specifically, the dimension "uncertainty avoidance" was dropped based on the feedback from the responses and the EFA.

The final five dimensions obtained after the EFA are *PD*, *TO*, *IVR*, *IVC* and *MVF*. To examine the uni-dimensionality of these constructs, five new independent EFAs

were conducted, each with only the items suggested in the previous step (the shaded items in Table 5). After the analysis, the five factors only extracted one factor each, which validates our approach. Table 6 provides the mean scores and the interpretation for these selected cultural dimensions.

Table 6. Mean scores for Ghanaian cultural dimensions

<b>Factor</b>	<b>Mean score</b>	<b>Interpretation</b>	<b>Attribute</b>
PD	3.23	High	High level of inequalities in power distribution.
TO	3.60	High	Short term orientation. People have respect for traditions, a relatively small propensity to save for the future and a focus on achieving quick results.
IVR	3.74	High	People have the desire to enjoy life and having fun. People place higher degree of importance on leisure time, act as they please and spend money as they wish.
IVC	4.27	High	People have attention for themselves and their close relatives.
MVE	4.00	High	Masculine society. Assertiveness and competitiveness in individuals and within social groups are encouraged.

Source: The Hofstede Centre (2016)

Table 7 provides the statistics for reliability and convergent validity of the five factors obtained. The reliability of the individual items was vouched for by their high loads. With the exception of two factors (IVR and MVF) whose Cronbach's alpha was less than 0.7, the Cronbach's alpha and the composite reliability for all of the factors exceeded the threshold value of 0.7 for internal consistency (Nunnally and Bernstein, 1994). The average variance extracted (AVE) for each factor was also greater than 0.5, which is the benchmark of the recommended threshold (Fornell and Larcker, 1981). The Cronbach's alpha values did not improve when any of the items were removed from the scales for each dimension, and again, with the exception of two factors (IVR and MVF), the correlations between each item and the total corrected scales were all far beyond 0.5.

Convergent validity was confirmed for all of the factors, where all of the items were shown to have significant loads ( $t > 2.58$ ) (Malhotra, 1999).

Table 7. Loads of the five factors and their reliability statistics.

	<b>PD</b>	<b>TO</b>	<b>TVR</b>	<b>IVC</b>	<b>MVF</b>
	PD1 0.893	TO1 0.826	IVR4 0.759	IVC1 0.928	MVF3 0.809
	PD2 0.856	TO2 0.819	MVF2 0.755	IVC2 0.928	MVF4 0.809
	PD3 0.832	TO3 0.815	IVC4 0.702		
	UA4 0.748	TO4 0.781			
Cronbach's alpha	0.842	0.825	0.569	0.837	0.472
Range of Cronbach's alpha if one item is deleted	0.752 - 0.855	0.772 - 0.797	0.443 - 0.454		
Range of correlations between items and total corrected scale	0.586 - 0.786	0.614 - 0.668	0.356 - 0.413	0.721	0.309
Composite reliability	0.900	0.884	0.783	0.925	0.791
Average variance extracted (AVE)	0.695	0.657	0.546	0.861	0.654

\* All loads significant at p-value = 0.01

Table 8 gives the results for the analysis of discriminant validity, which was conducted using linear correlations or standardised covariances between latent factors by examining whether the inter-factor correlations were less than the square root of the AVE (Fornell and Larcker, 1981). Table 8 shows that the square roots of each AVE were greater than the off-diagonal elements. Thus, discriminant validity was verified (Hair et al., 2010).

Table 8. Correlation matrix of latent factors

<b>Factors</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1. PD	0.834				
2. TO	-0.160	0.810			
3. IVR	0.335	-0.076	0.739		
4. IVC	0.007	-0.123	0.061	0.928	
5. MVF	0.319	0.011	0.208	0.040	0.809

To set up the definitive scale, an analysis of the five dimensions as dimensions of a second-order confirmatory factor analysis (CFA) was conducted. The model was estimated using the robust maximum likelihood method from the asymptotic variance–covariance matrix. The fit statistics that were obtained in the measurement model estimation in Table 9 show that the variables converged towards the factors established in the CFA. The Satorra–Bentler  $\chi^2$  was 371.28, with 179 degrees of freedom and a p-value of 0.000;  $\chi^2/df$  was 2.07, which was below the acceptable limit of 5. The root mean-square error of approximation (RMSEA) was 0.098 and the comparative fit index (CFI) was 0.870. Taking the significance of the robust  $\chi^2$  statistic with caution and noting the global indicators, it is apparent that the global fit was acceptable. Table 9 again provides the standardised coefficients for the relationships established by the model and its t-values, out of which the following findings can be deduced. First, Table 9 shows that PD has a significant influence on CPM in DCs (standardised coefficient of 0.709 and a t-value of 9.840). TO was also shown to be a significant predictor of CPM in DCs (standardised coefficient of 0.658 and a t-value of 7.970).

Table 9. Confirmatory factor analysis

<b>Dimension</b>	<b>Item</b>	<b>Load</b>	<b>t-value</b>	<b>r<sup>2</sup></b>
PD	PD1	0.758	–	0.574
	PD2	0.773	9.630	0.597
	PD3	0.761	9.670	0.579
	UA4	0.622	7.210	0.386
TO	TO1	0.865	–	0.749



	TO2	0.794	10.090	0.631
	TO3	0.720	13.280	0.519
	TO4	0.678	9.620	0.459
IVR	MVF2	1.000	–	1.000
	IVR4	0.348	3.990	0.121
	IVC4	0.344	4.340	0.118
IVC	IVC1	1.000	–	1.000
	IVC2	0.754	6.720	0.568
MVF	MVF3	1.000	–	1.000
	MVF4	0.394	5.850	0.155

Table 9 (continued). Confirmatory factor analysis

	<b>Dimension</b>	<b>Standardised Coefficient</b>	<b>t-value</b>	<b>r<sup>2</sup></b>
CPM	PD	0.709	9.840	0.757
	TO	0.658	7.970	
	IVR	0.015	0.226	
	IVC	-0.094	-1.558	
	MVF	0.003	0.057	

<b>Goodness of fit summary</b>	
Satorra–Bentler scaled $\chi^2$	371.2779
Degrees of freedom (df)	179
p-value	0.00000
$\chi^2 / df$	2.0742
Comparative fit index (CFI)	0.870
Root mean-square error of approximation (RMSEA)	0.098
90% confidence interval of RMSEA	(0.084 - 0.112)

Table 9 further shows that IVR has a causal relationship with CPM in DC but that the relationship is not statistically significant (standardised coefficient of 0.015 and a t-value of 0.226). Finally, the remaining two dimensions, IVC (standardised coefficient of -0.094 and a t-value of -1.558) and MVF (standardised coefficient of 0.003 and a t-value of 0.057), were found to be non-significant predictors of CPM in DCs. Table 10 shows the number of remaining items (and dimensions) after each debugging step. It also shows the number of remaining items in the final scale.

Table 10. Number of items after each step.

Original dimensions	Number of items from LR	EFA	CFA	Definitive dimensions
PD	4	4	4	PD
IVC	4	2	2	IVC
MVF	4	3	3	MVF
UA	4	–	–	–
TO	4	4	4	TO
IVR	4	2	2	IVR
Number of items remaining	24	15	15	

## DISCUSSION

This study aimed to create a model that will help to understand NCDs and their impacts on CPM in DCs, with the empirical application considering the case of Ghana. To achieve this goal and building upon the existing literature, a model has been proposed that consists of 15 items that distribute along five dimensions, namely: PD, TO, IVR, IVC, and MVF. These dimensions have been found to be reliable, and show convergent and divergent validity.

The test run confirmed that PD significantly influenced CPM in DCs. This finding supports the first hypothesis ( $H_1$ ) of this study and our initial intuition that the high average score obtained for PD indicates that Ghanaian society, and by extension DCs, are relatively unconcerned with inequalities and gaps at work and in their countries. Therefore, employees are comfortable with the rules that are put forward by the authorities. The idea of respecting the elderly and superiors at work is a significant feature of their NC. However, the gaps between employees and managers, politicians in authority and the ordinary citizen and so on, partly account for the challenges associated with CPM in DCs. This happens because countries with higher PD are likely to have a situation where project team management is given little prioritisation, which generally affects CPM. These results appear to be intuitively sensible (Ong and Bahar, 2019; Ojiako et al., 2014) and are in line with those of Owusu-Ansah and Louw (2019).

The dimensions IVC and MVF were non-significant predictors of CPM in DCs. This finding contradicts our second hypothesis ( $H_2$ ) but supports the third hypothesis ( $H_3$ ). For most CPM approaches, a roadmap that assists the management of HR activities such as interpersonal relationships, conflict resolution, team-building, recognition and rewards, and so on that may be impacted on by gender role divergence or convergence in a country is already catered for. Therefore, CPM is expected to be successfully carried out independent of the masculine and feminine dimension of the DCs. Even though these findings confront those obtained by Owusu-Ansah and Louw (2019), and Ojiako et al. (2014), there is a stream in the literature that supports them (e.g., Kivrak et al., 2009; Ankrah et al., 2009).

Another key finding of this study is the role played by TO in explaining CPM. According to the findings, TO was found to be a significant predictor of CPM in DCs, which supports the fifth hypothesis ( $H_5$ ) of this study. Countries that hold a conventional historical short-term point of view show no pragmatic future-oriented perspective, have an education system that does not prepare people for the future (as in the case of Ghana and many DCs), and are likely to manage their construction projects in haste, which normally leads to problems in CPM. This finding agrees with the adoption of long-term plans for CPM in DCs. Yet, it contradicts that of Owusu-Ansah and Louw (2019), who did not find that TO was a significant dimension in their study of NC. However, after a careful examination of this work, it was found that their model was not used to measure CPM in DCs. Our model and results are more aligned with those reported by Yen and Pulatov (2007), who defined a model made up of the items that dealt with issues as to whether a society has strong respect for traditions and rituals.

The final finding of this study is that IVR has a causal relationship with CPM in DCs, although the relationship is not statistically significant, which supports our sixth hypothesis ( $H_6$ ). How people in DCs desire to enjoy life, have fun, spend money, emphasise on leisure and act as they wish has nothing to do with CPM in these countries. If people have the required competence and commit to achieving the CPM target, then the orientation of the project team with respect to how they lead their life outside the project-oriented organisation is not a major consideration for CPM. This finding adds strength to the work of Ojiako and Chipulu (2014) in which the authors did not find IVR to be a significant predictor of project success or failure.

Several managerial implications can be drawn from the findings of this study. First, managers of large-scale projects that are supposed to be completed by employees with different cultural orientations in DCs need to recognise the effects of these NCDs on CPM within culturally diverse work environments. This will help them to deal with issues of intolerance, mistrust, communication gaps and wrong

decision-making, which can undermine the success of the construction project to be managed in these countries.

Second, if they want to successfully manage construction projects in these countries, then project managers in DCs need to focus more on the main cultural dimension, especially the level of inequality, time orientation and the level of indulgence of the DCs where they are operating . Project-oriented organisations that send expatriates to manage construction projects in DCs need to train them in cultural intelligence. They need to appreciate different cultural dimensions and collaborate effectively with other project team members.

Finally, it is important for managers of project-oriented organisations to recognise that their employees have a set of ideologies and values that dictate their behaviour. Therefore, for successful CPM, managers need to learn the culture of the society of their employees and formulate organisational policies that meet their needs. Managers of multinational project-oriented organisations also need to identify the cultural differences in societies that they operate if they wish to find a fine balance for the construction project's success.

## **CONCLUDING REMARKS**

Given the lack of clarity on cultural influences on CPM, as posited by Ojiako and Chipulu (2014), further research ought to be carried out to address this gap. Consequently, this study has made an effort to highlight the impact of NCDs on CPM in DCs. Within this context, the original contribution of this study is based on the hope that the findings of this study will help managers of multinational project-oriented organisations to understand CPM in DCs from the cultural perspective. Being aware of the impact of NCDs of DCs on CPM will help project managers to devise ways of dealing with cultural misunderstandings, which will eventually lead to appropriate approaches to CPM in these countries.

This study provides new insight to both policy makers and opinion leaders who make decisions concerning construction projects in DCs on how the cultural dimension affects CPM in their country. This study will help policy makers in DCs to realise that for effective CPM, they need to address the issues of social inequalities that are prevalent in their countries and adopt a long-term developmental plan.

The model that is created in this study is expected to be of value to scholars because it provides for the first time a valid instrument that accounts for NCDs when dealing with CPM. The proposed scale encompasses the main dimensions of NC discussed in the literature and has the potential to be adapted to other cultural settings.

This study is not free of limitations, even though it was conducted using a rigorous process. These limitations also offer new avenues for future research. First, the

empirical application used a sample from one country. Consequently, future research might consider using a broader sample for better inference. The second limitation refers to the dimensions included. Although the results indicate an acceptable model fitting, some of the dimensions that we obtained appear to contradict our earlier hypotheses. Further research is needed to better understand the reasons behind this result and validate our approach. It is also worth noting that although all of the participants of this study were members of the PMI, a few of them (such as graduate students) might not be practising as construction project managers, and therefore they might not have sound professional experience as project managers. Finally, this study does not consider the users of the construction projects. Therefore, future research might consider including the users because they are the recipients of these projects.

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