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DOES IT MATTER IF RESEARCHERS USE INDIVIDUAL DIMENSION CONSTRUCTS OR ONLY AGGREGATED CONSTRUCTS OF CULTURAL DISTANCE AND CULTURAL INTELLIGENCE?

Robert L. Engle, Quinnipiac University Briana Nash, Quinnipiac University

ABSTRACT

In a globalizing economy, growing numbers of employees work and live away from their home country. However, there are great risks involved with expatriate failure, which can lead to steep costs of lost business and employee relocation. The top reason for failure is the inability of the expat or their family to adapt to the host country. One way that has been used to study the likeliness of success is Cultural Intelligence, which has been linked with cultural adaptability and expatriate performance.

International experience has been linked with the development of Cultural Intelligence. There has been little study of the impact of the amount of time spent in another country on developing Cultural Intelligence, and results have been conflicting. Also, differences between home and host culture may be expected to have an impact on the development of Cultural Intelligence; in this study, Cultural Distance is used to compare country cultures. The interaction of time and Cultural Distance also may potentially reflect a relationship with Cultural Intelligence, and has not been used before, to our knowledge.

Studies of Cultural Intelligence and Cultural Distance are typically limited to use of an aggregate measure of the multidimensional constructs. This study examined the connection of experience abroad, measured by Cultural Distance between home and host country and time spent there, as an antecedent of Cultural Intelligence. This study is in response to criticism of using an aggregated measure of Cultural Distance, and employed the use of individual dimensions of both Cultural Distance and Cultural Intelligence. The primary objective of this paper is to focus on the degree to which potential additional important insights are contributed by the use of individual versus aggregated construct variables.

Using a sample of 185 university students, analysis of the aggregates and individual dimensions showed that important statistically significant insights were overlooked when using aggregated constructs, and that the use of individual dimensions provides more useful information. The introduction of time spent in another country as an antecedent to Cultural Intelligence showed statistical significance with only Cognitive and Behavioral Cultural Intelligence, also providing support for the explanatory power of individual dimensions. Finally, analysis of the time and Cultural Distance variables show varied results, adding significance to a model of Meta-Cognitive Cultural Intelligence.

INTRODUCTION

Compared with previous centuries, the 21st Century sees a proliferation of cars speeding across valleys, trains penetrating mountains, and planes defying the barriers formed by oceans. The world has been transformed by innovations in transportation and communication technologies, bringing people and nations closer together than ever before. Economies have been transformed by the sourcing of materials and competencies from where they are most abundant, and travel has increased in pursuit of lower costs and new markets. Revenues of the airline industry have more than doubled to an expected \$830 million in 2014, from \$370 million at the turn of the millennium (Euromonitor International, 2014), reflecting this boom. Geographic miles, however, are not the only distance between places as is quickly learned from time spent abroad, and success in international relations are not guaranteed simply by physically showing up in another country. "One's destination is never a place, but rather a new way of looking at things" (Miller, 1957). One must be able to see through the eyes of those whom they are working and negotiating with.

In the context of business, the ability of individuals to adapt to multicultural situations is of particular importance to multinational and global organizations. There are estimated to be over 900,000 global organizations, and over one million people working and living away from their home countries (Odell & Spielman, 2009). There are steep risks and costs involved with expatriate failure including lost time (Yeaton & Hall, 2008), damage to a company's image (e.g. internal and external) (Harzing & Christensen, 2004) and premature return to home country due to assignment failure (Harvey, Napier, & Moeller, 2011). The most commonly cited reasons for expatriate failure include the inability of managers or their families to adapt to the host country (Stone, 1991), and Selmer et al (2007) caution companies to be particularly diligent when selecting a candidate for an international assignment. Thus companies need to be able to determine the ability of the candidate to adapt and be successful in the challenging environment of cross-cultural assignments.

One tool to make such determination that has emerged in relatively recent times has been that of "cultural intelligence" (Earley & Ang, 2003). Since its introduction, there has been active study to identify antecedents and outcomes of cultural intelligence, including its ability to positively impact cultural adaptability (Ward & Fischer, 2008) and expatriate performance (Shaffer & Miller, 2008), among others. One antecedent that has been examined in a limited manner is that of foreign travel experience (Crowne, 2008). However, little research has examined whether longer times in a foreign country really resulted in a greater impact on cultural intelligence than did visits of a shorter duration (Ang, Van Dyne, & Tan, Cultural Intelligence, 2011). Other research has also suggested that the cultural distance (differences in cultural values) between the native country of the traveler and the country visited, may have an impact on the development of cultural intelligence which varies based on that distance (Ramsey, Leonel, Gomes, & Reis-Monteiro, 2011). However, the many past attempts to measure the impact of cultural distance has come under criticism for a number of reasons including the prevalence of using only aggregated measures of distance between what is now six of Hofstede's cultural values (Shenkar, 2012).

The objective of this study is to address these gaps in the literature by exploring the potential differences of the impacts of individual and aggregated cultural distance measures on each of the cultural intelligence dimensions, as well as to explore the potential interaction of each of the individual cultural distances and the time spent in a foreign country with regards to their impact on each of the dimensions of cultural intelligence. The results of this study may have the potential to assist educators and researchers in building models for developing cultural intelligence that in turn will assist business in their selection and development efforts when addressing this important competency.

CULTURAL INTELLIGENCE

Cultural Intelligence, or CQ, is defined as "an individual's capability to function and manage effectively in culturally diverse settings." (Ang & Van Dyne, 2008) In a world with increasing cross-border interactions both professionally and socially, an individual's ability to effectively interact with people and organizations of different origin is becoming more important. CQ is a way to measure this ability, and is unique from other measures of "real-world" intelligence, such as social intelligence, emotional intelligence, and practical intelligence. Social intelligence relates to dealing with people, emotional intelligence describes self-awareness and self-management, and practical intelligence pertains to getting things done (Albrecht, 2006). Earley and Ang (2003) argue that while socially and emotionally intelligent individuals are able to interpret and categorize behavioral manifestations into specific "universal" behaviors and recognize idiosyncratic individual behavior that differs from this pattern within their own cultural frame of reference, it requires a culturally intelligent person to recognize the behaviors and patterns that are rooted in an unfamiliar culture. The result, according to Early and Ang, is that it is possible for managers to be socially and emotionally intelligent in their own culturally unfamiliar setting.

Cultural Intelligence is a multidimensional construct that includes metacognitive, cognitive, motivational and behavioral dimensions (Ang & Van Dyne, 2008). Its developers see metacognitive CQ as the level of awareness an individual has in cross-cultural interactions which involves "planning, monitoring, and revising mental models of cultural behavior." It is the mental *process* one goes through when interacting with people of different backgrounds. The cognitive dimension of CQ, in contrast, relates to the cumulative level of *knowledge* one has of norms, practices, and conventions in different cultures. These are learned both through educational mediums and personal experiences. Motivational CQ reflects the amount of energy and attention that one is able to direct towards cultural learning, and is based on personal interest and confidence in cross-cultural situations. The last dimension, behavioral CQ, is the ability to interact effectively, both verbally and nonverbally. It differs from formerly mentioned dimensions in that it has to do with actions or behavior of the individual, while the others relate to the mind. Ang and Van Dyne see metacognitive, cognitive, motivational and behavioral CQ as different types of capabilities that together form the total cultural intelligence construct (TCQ).

When considering the potential impact of CQ on addressing a range of culturally specific problems, it would seem that each of the four cultural intelligence dimensions may play a significant role. For example, research has suggested that one or more of the cultural intelligence dimensions have an impact on the development of problem solving cross-cultural negotiation skills (Engle, Elahee, & Tatoglu, 2013), cross-cultural adaptation (Dagher, 2010; Ward & Fischer, 2008), the likelihood of accepting a job in a foreign country (Engle, Dimitriadi, & Sadrieh, 2012), task performance (Ang S. , et al., 2007), trust within teams (Rockstuhl & Ng, 2008), group performance (Huber & Lewis, 2010), global leadership skills (Ng, Van Dyne, & Ang, 2009), and expatriate performance (Lee & Sukoco, 2010). Because of the implications attached to cultural intelligence, for both research purposes and business practices there is good reason to investigate possible predictors of the CQ measure.

There are a number of antecedents of cultural intelligence that have been identified and/or proposed. These include the personal characteristics of openness to experience, risk orientation and need for control (Engle & Nehrt, 2012), language skills, living in diverse cultural settings, cross-cultural work experience (Triandis, 2008), parental and educational experiences (Shannon & Begley, 2008), language and multicultural experiences (Engle, Dimitriadi, & Sadrieh, 2012;

Shaffer & Miller, 2008), personality (Ang & Van Dyne, 2008; Shaffer & Miller, 2008), and arguably one of the most promising antecedents of cultural intelligence: experience, including international travel, work experience, study abroad, and perceived self-efficacy (Engle & Crowne, 2014; Crowne, 2008; Lee & Sukoco, 2010; MacNab & Worthley, 2011).

INTERNATIONAL EXPERIENCE AND CULTURAL INTELLIGENCE

Shannon and Bagley (2008) found international travel work related experience had a significant impact on CQ, however, they did not measure time spent during these experiences. Tay, Westman and Chia (2008) examined work related short-term foreign travel experiences and concluded that, contrary to their expectations, the short-term work experiences did not significantly predict cultural intelligence. Lee and Sukoco's (2010) results suggested that international work related experiences did not have a direct effect on cultural adjustment and cultural effectiveness but did have a significant impact when combined with a high level of cultural intelligence. Unfortunately, they did not examine impact of experience on the development of cultural intelligence. Tarique and Takeuchi (2008) examined the impact of non-work related travel experience and found the number of trips and the time spent, as well as the interaction of number of experiences and time to be significant predictors of cultural intelligence. They also found that when individuals had shorter (time) international non-work experiences, the number of such experiences were a significant predictor of cultural intelligence. They did not take into consideration, though, the potential cultural difference in one or more of the travel experiences. Engle and Crowne (2014) found relatively short one to two week non-work, activity-managed experience in a country did result in a significant increase in cultural intelligence. However, they also did not consider the cultural differences between native country and the country visited and did not compare it to longer such visits.

In their review of the literature Ang, Van Dyne and Tan (2011) concluded that international experience results in studies were conflicting and more research in this area was needed. This study will specifically examine a specific international experience that has not to our knowledge been specifically examined to date: the specific foreign country where the most time has been spent, including the duration of time spent there.

CULTURE

Hofstede (2010) defines culture as the "collective programming of the mind that distinguishes the members of one group or category of people from others" (p. 6). Culture is therefore learned and the result of one's social environment. Hofstede (1980) originally identified four cultural values which differentiate one culture from another: power distance, individuality versus collectivism, masculinity versus feminism, and uncertainty avoidance. Hofstede (2001) later added a fifth dimension: long-term versus short-term orientation. Hofstede, Hofstede, and Minkov (2010) added a sixth dimension—"indulgence versus restraint" (indulgence)—and recently Hofstede replaced long-term orientation with "pragmatism versus normative" (normative) in his *Hofstede Center* (Hofstede, 2014). Therefore, for the purposes of this study this most current list of cultural value dimensions will be used to define culture differences between countries. These are defined as follows (Hofstede, Hofstede, & Minkov, 2010):

Power Distance: "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (p. 61).

Individualism vs. Collectivism: Individualism "pertains to societies in which the ties between individuals are loose: everyone is expected to look after him-herself and his or her immediate family. Collectivism...pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty" (p. 92).

Masculinity vs. Femininity: "A society is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be modest, tender, and concerned with the quality of life. A society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life" (p. 140).

Uncertainty Avoidance: "the extent to which the members of a culture feel threatened by ambiguous or unknown situations" (p. 191).

Indulgence vs. Restraint: Indulgence stands for "a tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun. Restraint reflects a conviction that such gratification needs to be curbed and regulated by strict social norms" (p. 281).

Pragmatism vs. Normative: "societies who score low on this dimension (normative) prefer time-honored traditions and norms while viewing societal change with suspicion. Those with a culture that scores high (pragmatic), on the other hand, take a more pragmatic approach: they encourage thrift and efforts in modern education as a way to prepare for the future" (Hofstede, 2014).

CULTURAL DISTANCE

The concept of "distance" has been defined as the numerical description of the space between objects (Kandogan, 2012) and has been extended to measure gaps between countries. Distance between countries can be measured by using constructs from institutional theory, including formal and informal institutions, and other dividing factors such as geographic distance, language differences, and economic differences (Hutzschenreuter, Kleindienst, & Lange, 2014).

Culture is considered an informal institution and has been a very popular construct to use when measuring distances between countries (Kim, Kirkman, & Chen, 2008; Shenkar, 2012). Perhaps the most popular measure of the often used construct of cultural distance is the aggregated value using Hofstede's (1980) four cultural value dimensions, as proposed by Kogut and Singh (1988), and is often referred to as the "Kogut and Singh Index" (Kandogan, 2012). Over time it has also attracted criticism, as there are conceptual and methodological deficiencies with the construct, including the methodological observation that this measure weights all of Hofstede's dimensions equally, neglecting to investigate any variability or even theoretical support for their impact. (Shenkar, 2001; 2012). Some of the conceptual shortcomings also include assumptions that the distance is symmetric in both directions between countries (Zaheer, Schomaker, & Nachum, 2012) as well as criticisms of the measure's data source (McSweeney, 2002).

Still, a number of researchers have found a way forward. To completely reject the Hofstede model and its use to measure distance would be throwing away valuable insights (Signorini, Wiesemes, & Murphy, 2009). The roots of Cultural Distance in Hofstede's data may, in part, explain conflicting results when the aggregate has been used. More importantly, though, there is

also clearly a missing level of analysis by using a singular aggregate. While we recognize the importance of a distance measure including more than just the measures of Hofstede's cultural dimensions, for the purposes of this study we are starting this journey to measure distance by concentrating on only the cultural distance portion of a broader distance construct. This study begins to address the gap in research regarding the impact of international travel experiences on Cultural Intelligence by exploring the role of Cultural Distance between the subject's home country and the foreign country visited.

RESEARCH QUESTIONS

In an effort to better understand an individual's international travel experience as a potential antecedent to cultural intelligence, our goal in this research paper is to explore the potential differences between aggregate and individual measures of cultural distance, with and without interaction with time, using Hofstede's most recent cultural value dimensions. Our specific research questions are:

- *RQ1a* How will the cultural distance of each of Hofstede's cultural value dimensions impact each of the four individual measures of cultural intelligence as well as total cultural intelligence?
- *RQ1b* How will the aggregated cultural distance of all Hofstede's dimensions impact each of the four individual measures of cultural intelligence as well as total cultural intelligence?
- *RQ2* Given the country where a subject has spent the most time, how has that time impacted each of the four dimensions of Cultural Intelligence as well as total cultural intelligence?
- RQ3a Given the country where a subject has spent the most time, to what degree does each of Hofstede's cultural value dimensions interact with time spent to impact each of the four individual measures of cultural intelligence as well as total cultural intelligence?
- RQ3b Given the country where a subject has spent the most time, to what degree does the aggregated cultural distance of all Hofstede's dimensions interact with time spent to impact each of the four individual measures of cultural intelligence as well as total cultural intelligence?

Answers to the above research questions will give us additional needed insight to the potential relationship differences in individual versus aggregated measures of cultural distance and cultural intelligence, as well as further insight to the role of cultural distance and time with regards to the level of cultural intelligence.

METHODOLOGY

The sample for this study consisted of 185 undergraduate business students from a single university representing a wide range of business majors. There were 96 men (52%) and 89 women (48%) with an average of 3.5 years of university education and average age of 20.9. It was felt that this subject population would be appropriate as the majority of students are in the latter stage of their undergraduate business education, about to enter the workforce, and many of the students will have had the opportunity for exposure to foreign travel and study abroad experiences that were being examined in this study.

The data were collected from questionnaires administered in a classroom setting and were voluntary, and subjects were not given incentives for survey completion. There were a total of 226 questionnaires handed out and those subjects who were not U.S. citizens and/or whose questionnaires were not adequately completed were eliminated reducing the number to 210 usable questionnaires (93%). In addition there were 25 subjects whose country where they spent the most time did not have available cultural dimension data with which to calculate cultural distance. This resulted in 185 usable questionnaires (82%).

Cultural intelligence was measured using the self-report instrument developed and validated by Van Dyne, Ang, and Koh (2008). All questions used Likert scales, with "1" being "strongly disagree" and "7" being "strongly agree". A sample question is "I am conscious of the cultural knowledge I apply to cross-cultural interactions." During the validation process these authors identified the 20 items with the strongest psychometric properties with a Chi-square of 822.26 (164 df), CFI of 0.92. and RMSEA of 0.08. Nested model comparisons demonstrated the superiority of the hypothesized four-factor CQ model. The instrument, tested for generalizability across samples and analysis using structured equation modeling (SEM) demonstrated good fit, also finding acceptable Cronbach alphas along with Chi-Square of 381.28, CFI of .96, and RMSEA of .05. These researchers also completed an analysis of generalizability across time, generalizability across countries, generalizability across methods (observer report and self-report), as well as discriminant validity, incremental validity, and predictive validity (with cultural decision-making, interactional adjustment, and mental well-being as dependent variables). Their study concluded that the construct appeared to have a clear, robust, and meaningful structure with a high correlation between self-report and observer report instruments. Shannon and Begley (2008) confirmed the stability of the psychometric properties of the Van Dyne, Ang, and Koh (2006) model, and in a detailed review of CQ instruments Matsumoto and Hwang (2013) concluded that there was considerable evidence for construct, convergent, and predictive validities of this instrument.

Factor analysis of the four CQ factors was also conducted using this study's dataset (maximum likelihood, varimax rotation), which confirmed all four CQ factors. The lowest loading of the twenty questions making up the four CQ factors is above .500, and therefore above the .400 threshold suggested for acceptable loading factor items (Hair, Black, Anderson, & Tatham, 2006). In addition, all Cronbach alpha scores are above the .700 level, both of which suggesting satisfactory reliability (Hair, Black, Anderson, & Tatham, 2006).

For the calculation of cultural dimensions the six dimensional model of Hofstede as described by Hofstede, Hofstede, and Minkov (2010) for the dimensions of Power Distance, Individuality, Masculinity, Uncertainty Avoidance, and Indulgence – and for Pragmatism (formerly Long-Term Orientation) as described by Hofstede (2014). Cultural distance (CD) for each dimension was calculated using the formula:

 $\sqrt{(Country \, Dimension_i \, Score - US \, Dimension_i \, Score)^2}$

where $Dimension_i$ represents one of the six cultural dimensions being measured. The aggregated or total cultural distance score is the sum of each of all six cultural distances.

Subjects were asked to indicate the country outside of the USA where they have spent the most time and to indicate the total approximate time in weeks that they spent there (cumulative), allowing the calculation of a "Time" score for each subject. Thus, the cultural distance was multiplied by the number of weeks spent in that country to give the CD*Time score. The students were also asked to list the countries outside of the USA and the sum of those countries resulted in

the total number of countries visited score (# countries). If a subject had never traveled outside the United States they received a score of "0". Cultural distance and time interaction was calculated for each of the six individual cultural dimensions (e.g. CDMAS for the cultural distance for the masculinity dimension), as well as for the total cultural distance (the sum of all six dimensions).

RESULTS

As can be seen in Table 1, of the four individual cultural dimensions, Motivational CQ had the highest mean score (4.98) and Cognitive CQ had the lowest mean score (3.51). The Total CQ score, which was calculated as the mean of all four dimensions, was 4.41. Cultural distance scores of the countries in which the subject spent the most time varied from a high of 27.16 for CD Individuality to a low of 9.64 for CD Masculinity. The mean total cultural distance score which was calculated as the sum of all six cultural dimensions was 112.47.

Table 1													
Descriptive Statistics													
N Min Max Mean Std. De													
Meta-Cognitive CQ	185	2	6.75	4.83	0.89								
Cognitive CQ	185	1.67	5.5	3.51	0.83								
Motivational CQ	185	1.8	7	4.98	1.02								
Behavioral CQ	185	1.6	7	4.39	0.99								
Total CQ	185	2.53	6.21	4.41	0.71								
CD Power Distance	185	0	50	15.62	14.76								
CD Individuality	185	0	74	27.16	12.65								
CD Masculinity	185	0	57	9.64	9.14								
CD Uncertainty	185	0	54	22.38	16.99								
CD Pragmatism	185	0	67	19.41	16.57								
CD Indulgence	185	0	64	18.26	16.23								
CD Total	185	0	251	112.47	72.24								

Table 2 describes the time spent by the subjects in the single country where they spent the most time outside the USA. Of all subjects in this study, 23 or 12% had never been outside of their home country and 97 (53%) had been in another country with most time spent from 1 to 4 weeks, while 37 (20%) had been in another country between 5 and 20 weeks, and 28 (15%) 20 or more weeks. The mean time for all subjects is 44 weeks, a number impacted by 19 of the students that spent 2 or more years living in that country. The median time spent in the country for all subjects was 2 weeks.

Table 2 Time Spent in Weeks*												
# weeks	number	%										
0	23	12										
1 to 4	97	53										
5 to 20	37	20										
20 plus	28	15										

In the next series of analyses we used each of the four cultural intelligence (CQ) dimensions, as well as total cultural intelligence, as dependent variables and examined the impact of the control variables (age, gender, education) and each of the following independent variables: total/aggregate cultural distance between the USA and the foreign country in which the subject has

spent the most time (CD); power distance cultural distance (CDPDI); individuality cultural distance (CDIND); masculinity cultural distance (CDMAS); uncertainty avoidance cultural distance (CDUAI); pragmatism cultural distance (CDPRA); indulgence cultural distance (CDIVR); time spent in the country in which the most time in a foreign country has been spent by the subject (Time); the cultural distance (CD) interaction with time (CD*Time); the power distance cultural distance interaction with time (CDPDI*Time); the individuality cultural distance interaction with time (CDIND*Time); the masculinity cultural distance interaction with time (CDMAS*Time); the uncertainty avoidance cultural distance interaction with time (CDUAI*Time); the pragmatism cultural distance interaction with time (CDUAI*Time); the pragmatism cultural distance interaction with time (CDIVA*Time); and the indulgence cultural distance interaction with time (CDIVR*Time).

Table 3, using the subjects' level of meta-cognitive cultural intelligence as the dependent variable, indicates that individually neither the total cultural distance (CD) nor the time spent (Time) were significant predictors of meta-cognitive CQ. In addition, none of three control variables were significant predictors. However, the cultural distance of masculinity (CDMAS) was a significant predictor as were CDPDI*Time, CDIND*Time, CDMAS*Time, and CDIVR*Time. CDUAI*Time and CDPRA*Time were not significant predictors of meta-cognitive CQ. In none of these cases were any of the control variables significant.

Table 4, using the subjects' level of cognitive cultural intelligence as the dependent variable, found that none of the cultural distance variables predicted the level of cognitive CQ. However, time spent in another country did have a significant impact on this level. Time interaction with cultural distance variables did not significantly add the explanatory power of time used alone. None of the control variables were significant in any of the above models.

Table 5, using the subjects' level of motivational cultural intelligence as the dependent variable, found that cultural distance (CD) did have a significant impact on motivational CQ. Power distance cultural distance, masculinity cultural distance, uncertainty avoidance cultural distance, and pragmatism cultural distance were found to be significant predictors, with indulgence cultural distance (CDIVR) having the strongest ability to predict motivational CQ of any of these. Individuality cultural distance was not significant. Time was not a significant predictor but when interacting with cultural distance all interactions, except CDUAI*Time and CDPRA*Time, were significant predictors (all with significantly lower standardized betas than CDIVR). No control variables were significant in any of these models.

Table 6, using the subjects' level of behavioral cultural intelligence as the dependent variable, found cultural distance (CD) to have a significant impact on behavioral CQ. CDIVR and CDPRA were significant predictors, while CDMAS had the most significant impact with the strongest standardized beta of all the models. CDIND, CDPDI, and CDUAI were not significant. Time was a significant predictor, as were all the individual cultural distance and time interactions, with the exception of CDUAI, which was not significant. However, none of the interactions had a standardized beta at the level and significance as strong as CDMAS. Education was found significant with all interactions (not any cultural distance alone variables), with the exception of CDUAI*Time which was not significant. Age and gender were not found to be significant in any of the models.

	Table 3														
	Meta-Cognitive CQ (Dep.Var.)														
	Standardized Betas Model Model														
	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age	0.068	0.067	0.067	0.040	0.055	0.067	0.071	0.04	0.025	0.021	0.024	0.03	0.03	0.039	0.024
Gender	-0.108	-0.105	-0.105	-0.125	-0.092	-0.108	-0.109	-0.101	-0.098	-0.098	-0.096	-0.113	-0.101	-0.101	-0.097
Education	0.063	0.065	0.067	0.060	0.078	0.06	0.058	0.066	0.072	0.079	0.071	0.072	0.064	0.07	0.077
CD	0.03														
CDPDI		0.003													
CDIND			0.027												
CDMAS				1.50*											
CDUAI					-0.083										
CDPRA						0.037									
CDIVR							0.056								
Time								0.110							
CD*Time									0.171*						
CDPDI*Time										0.187*					
CDIND*Time											0.177*				
CDMAS*Time												0.204**			
CDUAI*Time													0.087		
CDPRA*Time														0.122	
CDIVR*Time															0.169*
R-Sq	0.022	0.021	0.022	0.043	0.028	0.023	0.024	0.033	0.049	0.054	0.051	0.061	0.029	0.035	0.048
Adj.R-Sq.	0.007	0.001	0	0.021	0.006	0.001	0.003	0.011	0.028	0.033	0.030	0.041	0.007	0.014	0.027
F-Score	1.01	.0976	1.01	2.01	1.29	1.04	1.12	1.52	2.31	2.58	2.41	2.95	1.32	1.65	2.29
Significance	.400	.420	.400	.096	.277	.388	.350	.198	.060	.039	.051	.022	.263	.163	.062

	Table 4														
						Cog	nitive CQ) (Dep. Vai	:.)						
	Standardized Betas Model Model														
	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age	0.026	0.025	0.023	0.001	0.022	0.023	0.027	-0.044	-0.044	-0.044	-0.043	-0.027	-0.014	-0.025	-0.045
Gender	0.008	0.016	0.017	0.006	0.021	0.011	0.014	0.030	0.031	0.030	0.035	0.010	0.031	0.028	0.033
Education	0.110	0.121	0.124	0.114	0.117	0.102	0.106	0.120	0.129	0.137	0.127	0.127	0.115	0.125	0.136
CD	0.107														
CDPDI		0.067													
CDIND			0.097												
CDMAS				0.115											
CDUAI					0.007										
CDPRA						0.177									
CDIVR							0.082								
Time								.265***							
CD*Time									.266***						
CDPDI*Time										.265***					
CDIND*Time											.269***				
CDMAS*Time												.265***			
CDUAI*Time													.196**		
CDPRA*Time														.204**	
CDIVR*Time															.264***
R-Sq	0.028	0.022	0.027	0.030	0.017	0.031	0.024	0.083	0.084	0.084	0.086	0.085	0.054	0.057	0.083
Adj.R-Sq.	0.007	0	0.005	0.008	-0.005	0.009	0.002	0.063	0.063	0.063	0.065	0.065	0.033	0.036	0.063
F-Score	1.31	0.994	1.23	1.37	0.788	1.42	1.09	4.08	4.14	4.12	4.21	4.19	2.57	2.71	4.08
Significance	.267	.412	.300	.245	.534	.229	.361	.003	.003	.003	.003	.003	.039	0.031	.003

							Table 5								
						Motivatio	nal CQ (De	ep. Var.)							
	Model	Model	Modal	Modal	Model	Stand	Model	etas	Model	Model	Model	Model	Modal	Model	Model
	1	2	3		5	6	7	8	Q	10	11	12	13	1/	15
Age	0.069	0.064	0.057	0.021	0.094	0.058	0.079	0.031	0.014	0.014	0.016	0.023	0.031	0.026	0.013
Gender	-0.045	-0.021	-0.014	-0.034	-0.048	-0.032	-0.038	-0.006	-0.003	-0.003	-0.001	-0.016	-0.002	-0.005	-0.001
Education	0.021	0.049	0.049	0.034	0.001	0.007	-0.005	0.041	0.047	0.052	0.046	0.047	0.038	0.045	0.052
CD	.291***														
CDPDI		.149*													
CDIND			0.134												
CDMAS				.193**											
CDUAI					.265***										
CDPRA						.252***									
CDIVR							.332***								
Time								0.099							
CD*Time									.169*						
CDPDI*Time										.162*					
CDIND*Time											.179*				
CDMAS*Time												0.135			
CDUAI*Time													0.135		
CDPRA*Time														0.128	
CDIVR*Time															.168*
D.C.	0.000	0.020	0.024	0.041	0.070	0.070	0.114	0.01.6	0.000	0.022	0.021	0.020	0.024	0.000	0.022
R-Sq	0.089	0.028	0.024	0.041	0.073	0.068	0.114	0.016	0.033	0.033	0.031	0.038	0.024	0.022	0.033
Adj.K-Sq.	0.069	0.007	0.002	0.020	0.052	0.048	0.094	-0.006	0.012	0.011	0.010	0.016	0.002	0.001	0.012
F-Score	4.40	1.31	1.11	1.94	3.54	3.29	5.78	0.712	1.55	1.53	1.44	1.75	1.10	1.01	1.54
Significance	.002	.412	.354	.106	.008	.012	.000	.585	.189	.197	.222	.140	.357	.405	.193

	Table 6														
						Be	havioral (CQ Poto							
	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age	-0.039	-0.042	-0.047	-0.091	-0.034	-0.046	-0.034	-0.090	-0.092	-0.097	-0.089	-0.085	-0.065	-0.084	-0.094
Gender	-0.086	-0.071	-0.066	-0.096	-0.078	-0.083	-0.081	-0.058	-0.057	-0.056	-0.055	-0.072	-0.059	-0.058	-0.055
Education	0.135	0.153	0.152	0.140	0.133	0.119	0.121	0.150	0.156*	0.162*	0.154	0.155*	0.147	0.154	0.160*
CD	.187**														
CDPDI		0.097													
CDIND			0.060												
CDMAS				.243***											
CDUAI					0.101										
CDPRA						.219**									
CDIVR							.201**								
Time								.169*							
CD*Time									.180*						
CDPDI*Time										.196**					
CDIND*Time											.170*				
CDMAS*Time												.201**			
CDUAI*Time													0.093		
CDPRA*Time														.159*	
CDIVR*Time										-					.181*
R-Sq	0.056	0.030	0.025	0.077	0.031	0.068	0.060	0.048	0.052	0.057	0.049	0.060	.030	0.045	0.052
Adj.R-Sq.	0.035	0.009	0.003	0.056	0.009	0.047	0.040	0.037	0.031	0.037	0.027	0.040	0.008	0.025	0.031
F-Score	2.65	1.41	1.11	3.75	1.44	3.27	2.89	2.28	2.46	2.74	2.29	2.89	1.38	2.13	2.48
Significance	.035	.231	.338	.006	.224	0.013	.024	.063	.047	.030	.061	.023	.245	.079	.046

p*<.05; *p*<.01; ****p*<.001

	Table 7														
							Total	CQ							
						S	tandardiz	ed Betas							
	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model	Model
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age	0.041	0.037	0.032	-0.011	0.046	0.033	0.047	-0.021	-0.032	-0.036	-0.031	-0.02	0	-0.015	-0.034
Gender	-0.079	-0.062	-0.057	-0.084	-0.068	-0.072	-0.073	-0.046	-0.043	-0.043	-0.04	-0.064	-0.044	-0.046	-0.041
Education	0.109	0.129	0.13	0.115	0.107	0.094	0.091	0.125	0.134	0.142	0.132	0.133	0.12	0.13	0.141
CD	.214**														
CDPDI		0.11													
CDIND			0.107												
CDMAS				.238***											
CDUAI					0.108										
CDPRA						.216**									
CDIVR							.234**								
Time								.210**							
CD*Time									.259***						
CDPDI*Time										.269***					
CDIND*Time											.255***				
CDMAS*Time												.280***			
CDUAI*Time													.168*		
CDPRA*Time														.202**	
CDIVR*Time															.258***
R-Sq	0.065	0.032	0.032	0.074	0.031	0.066	0.074	0.062	0.084	0.089	0.082	0.096	0.048	0.059	0.083
Adj.R-Sq.	0.044	0.011	0.01	0.053	0.01	0.045	0.053	0.041	0.063	0.068	0.062	0.076	0.026	0.038	0.063
F-Score	3.13	1.49	1.47	3.59	1.46	3.17	3.58	2.96	4.11	4.38	4.02	4.81	2.25	2.84	4.09
Significance	0.016	0.205	0.211	0.008	0.216	0.015	0.008	0.021	0.003	0.002	0.004	0.001	0.065	0.026	0.003

Using the subjects' level of total cultural intelligence as the dependent variable, Table 7 indicates cultural distance (CD) to have a significant impact on total CQ (TCQ) with CDMAS, CDPRA, and CDIVR also having significant relationships with TCQ. CDPDI, CDUAI, and CDIND were not significant. Time alone and all cultural distance and time interactions were found to be significant, with CDMAS*Time having the highest significance and standardized beta of all models that were found to have significant relationships with behavioral CQ.

DISCUSSION

The objectives of this study are to explore the potential differences of the impacts of individual and aggregated cultural distance measures on each of the cultural intelligence dimensions, as well as explore the potential interaction of each individual cultural distances with the time spent in a foreign country on cultural intelligence. As discussed earlier in this paper, these objectives are seen as important due to the criticisms that the aggregated measure of cultural distance (CD), which is so widely used by researchers today, and subsequent suggestions by critics (e.g. Shenkar, 2012) that individual cultural distance dimensions may be more meaningful when applied appropriately given the dependent variable. Another potential contribution of this research is the manner in which we identified the country that would be used to calculate cultural distance, i.e. country visited in which most time was spent. The related time dimension interaction with CD was also an approach which, to our knowledge, has not been used before. Finally, the use of the CD and CD*Time interaction to predict cultural intelligence is a relationship that to our knowledge has not previously been empirically explored.

Overall, we found clear support for Shenkar's (2012) argument that it matters if you use the aggregated construct for cultural distance or the individual cultural distance dimensions, as the use of the individual CD dimensions suggested insights that were not evident when using the aggregated version of cultural distance. For example, by using aggregated cultural distance as the only measure of cultural distance as done with the overwhelming number of published studies using cultural distance, one would conclude that this construct only predicted at significant levels total cultural intelligence (TCQ), behavioral CQ, and motivational CQ. However by examining each individual component of cultural distance, we find that specifically it is the cultural distance of PDI (power distance) and cultural distance of UAI (uncertainty avoidance) that significantly predicted motivational CQ, while the other four cultural variables were insignificant. Another example of lost detail when using aggregated CD is that when using Behavioral CQ as the dependent variable (see Table 6), the aggregated form of cultural distance (CD) indicated a standardized beta of .187. However, what this approach does not tell you is that only three of the six individual dimensions are significant predictors (CDMAS with standardized beta of .243, CDIVR with .201 and CDPRA with, .219) and that the other three CD-cultural dimensions actually lowered the explanatory power of the aggregate model given their insignificant relationship.

The same observation held true for the aggregate of cultural intelligence. When total cultural intelligence was used instead of the four sub-dimensions it was found once again that potentially important relationships were not evident. For example, using total cultural intelligence (TCQ) as the dependent variable (see Table 7) only three of the six individual CD dimensions have significance (CDMAS, CDPRA, CDIVR). However, when examining Motivational CQ specifically, for example, five dimensions are significant (CDPDI, CDMAS, CDUAI, CDPRA, CDIVR) and for Cognitive CQ none of the cultural distance dimensions were significant. This

supports the need to examine each of the individual cultural intelligence dimensions rather than an aggregate construct.

The introduction of time into the models also gave some interesting insights, as its importance varied across dimensions of culture distance and cultural intelligence. While time was found to be significantly related to total cultural intelligence, only two dimensions of cultural intelligence (cognitive and behavioral) had a significant relationship upon closer examination, and the other two (metacognitive and motivational) did not. Results also varied when time was interacted with cultural distance. For example, when examining behavioral CQ as the dependent variable, CDMAS explained 7.7% of the variance (*R*-*sq*.), while the highest *R*-*square* with a time interaction was CDPDI*Time at only 5.7% (*R*-*sq*.). A look at metacognitive cultural intelligence, on the other hand, reflected an increase of the explanatory power of CDMAS when it was interacted with time, from 4.3% when only CDMAS was used to 6.1% when used alone. For cognitive CQ, time alone explained 8.4% of the variance, and interaction with cultural dimensions added minimal value to the model. Clearly, the use of individual dimensions instead of just the aggregate captured key relationships with regards to time and cultural distance and time interactions.

An interesting finding was the significant non-linear inverted "U" relationships between meta-cognitive and cognitive cultural intelligence and some measures of cultural distance suggesting that the quadratic relationship has a higher ability to explain the scores in these CQ dimensions than does a linear relationship. Such a finding may suggest that the ability of the subject to process and organize cultural knowledge may be greater when the differences between the native country and the foreign country is of a moderate distance, as opposed to having a too little or too great a cultural distance between countries. If confirmed by future research this may be of critical importance in the development of cognitive cultural intelligence resulting in the need to explore this area in more detail and with different sample populations.

One of the limitations of this study is that it was conducted using a sample from only one university. The control variable, education, was significant in the behavioral dimension of cultural intelligence; the results could reflect teaching of cultural intelligence and thus the need to examine a number of larger universities with a variety of educational approaches and emphases on the development of cultural intelligence. Age and gender controls were not significant, however a larger sample which incorporated a much greater range in age may give us a more accurate insight into these controls. A further limitation is that this study only examined the foreign country in which the most time was spent, and does not include information about other places visited. Also, while the sample size is reasonable given the number of variables being examined in any one model (Hair, Black, Anderson, & Tatham, 2006) and validity checks confirm confidence in the results, a larger sample size may well have benefits. Finally, the results explain only a small part of the variance (with the highest Adj. R-sq. being 0.094, the impact of IVR distance on motivational CQ), suggesting the obvious need to identify and include more explanatory variables in the models.

This study has indicated that while aggregates may be useful for getting a basic picture of relationships, important relationships between individual dimensions are overlooked if not examined. Time spent abroad is also an important factor to consider in the development of cultural intelligence. Future research should develop a more complete model for predicting cultural intelligence. Other independent variables that should be included are time, as well as additional measures of "distance" between countries such as economic, geographic, and language factors, among others. Along with appropriate distance constructs, perhaps some type of weighting should

be developed for each cultural distance dimension construct used. Future studies should also include a larger sample from a variety of organizations, and consider a more comprehensive travel history. For researchers, this study gives direction towards building a full model for predicting cultural intelligence that includes cultural differences. These models may later be useful to businesses for the selection and development of international managers, who not only step into other countries, but also the shoes of those they do business with.

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