STUDY ON IMPACT OF CULTURE INTELLIGENCE ON EMPLOYEE CREATIVITY

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ABSTRACT

Holding the key to the course of innovation as the source of ideas, creativity draws gradually the attention of academic community and industry within the context of the innovation-driven social and economic development. Since numerous factors influence creativity, scholars extend progressively their perspectives of study from a single level to multiple levels. This paper studied the relationship between culture intelligence (CQ) and employee creativity by using a cross-cultural methodology. We conducted the multiple regression analysis using targeted culture intelligence scale and employee creativity scale by collecting data from 311 questionnaires selected from Baise City, China. This paper found that, culture intelligence (CQ) has significantly positive impact on employee creativity in multiple dimensions.

Keywords: Culture intelligence, Employee creativity

1. INTRODUCTION

Joy Paul Guilford, an American psychologist, reminded, in his inaugural speech when taking office of Chairman of American Psychological Association in 1950, that we should focus on an important human quality which has been neglected for quite a long period of time - creativity. From then on, a wave of study on creativity was set off. Creativity is a point of view or capability of a product whereby something new and somehow valuable is formed by individuals (Cropley, A.J. 2000). Management science studies human being. As employee is a fundamental element of an enterprise, how does the enterprise inspire employee creativity is a topic worthy of study. This paper studied the relationship between culture intelligence and employee creativity by using a cross-cultural methodology, with the former as an independent variable and the latter as a dependent variable. This cross-cultural study aimed to reveal the psychological mechanisms through which creativity is generated via investigation on the cultural factors that influence the generation and improvement of creativity. Cultures in different regions have far-reaching impact

on individuals. As a result, culture and creativity are closely related. People in different cultural backgrounds judge value differently. Culture also provides different ways by which individuals' psychological structures form. For instance, the Western individualism culture encourages independent exploration and innovation of individuals while the collectivism culture in the Eastern world emphasizes obedience, mostly through which dependency is generated and individual creativity is less likely to be stimulated. Therefore, comparatively, the individualism culture seems to be more conducive to development of creativity. This cross-cultural study on creativity contributes to the understanding of creativity from a cultural dimension as it was based on characteristics of creative behaviors of people in different cultural backgrounds.

2. LITERATURE REVIEW AND HYPOTHESES

Early definitions of the concepts of cultural intelligence were given by Earley and Ang in 2003. Later Earley and Ang (2006) further described four dimensions of CQ: Metacognitive CQ, Cognitive CQ, Motivational CQ, and Behavioral CQ. The four CQ capabilities specifically refer to a person's capability to cognize diverse cultures, a person's education background and experience, a person's willingness to accept culturally diverse settings and capability to focus his/her attention, and a person's capability to adapt behavior to make it appropriate to diverse cultures. The previous studies revealed that, these factors can be precisely regarded as antecedent variables that influence employee creativity. For instance, although cognition influences employee creativity, Scott et al. (1994) found in their studies that, systematic cognition style has adverse impact on an individual's creativity and intuitive cognition style has less positive impact on it. According to a study done by Sagive et al. (1995), the findings further showed that when lowly structured task is performed, intuitive cognition style leads to higher creativity than systematic cognition style does, while this does conversely when highly structured task is performed. Besides, the basic properties of an employee, e.g. education background, work experience, skills, and need for growth, also have significant impact on an individual's creativity. Furthermore, a specific behavior of an employee influences his/her creativity. M De Stobbelir et al. (2013) found in their studies that, the frequency and breadth of an employee's feedback-seeking behavior (feedback inquiry and feedback monitoring) are positively related to an individual's creative performance. A study conducted by Cerne et al. (2015) indicated that, knowledge hiding triggers the circulation of non-confidence among employees. As a result, they may be reluctant to share knowledge, resulting in an adverse impact on employee creativity.

We found that, some factors of cultural intelligence may become antecedent variables that influence employee creativity. Therefore, we put forward the hypotheses as follows.

H1: Metacognitive CQ has positive impact on employee creativity;

H2: Cognitive CQ has positive impact on employee creativity;

H3: Motivational CQ has positive impact on employee creativity;

H4: Behavioral CQ has positive impact on employee creativity.

In conclusion, to study the influence of cultural intelligence on employee creativity ,the conceptual framework might be as follows:

Figure 1: Conceptual framework of this study

3. METHODS

3.1 Selection of samples

We chose employees and their direct supervisors of a large company in Baise City, Guangxi Province, as our samples. This is a state-owned enterprises of 60 years history, and it has nearly 8000 employees. We use Systematic Random Sampling techniques, handed out 328 questionnaires through hard copies to them, and got 311 valid questionnaires returned with 94.8% validity rate. The core content of the questionnaire was governed by the aforesaid scales while the part containing control variables was designed by reference to design rules of study questionnaire. To avoid common variance, we collected data by using superior-underling pairing method. Therefore, we divided the questionnaire into superior part and underling part. Superior questionnaires were designed to measure dependent variable, i.e. employee creativity. To increase the degree of differentiation, the respondent of each superior questionnaire was required to evaluate three underlings simultaneously by filling the scores. Underling questionnaires were designed to measure independent variable and control variables, i.e. CQ, age, and whether a respondent has overseas study experience, etc. The respondent of each underling questionnaire was required to tick the appropriate scores. We used codes to record paired information. In order to improve the completion quality of questionnaires and minimize any deviations of subjects in comprehension of items, researchers were designated to the company for field instruction and collection of questionnaires.

3.2 Measurement of variables

3.2.1 Culture Intelligence Scale

Cultural intelligence was measured based on the Culture Intelligence Scale developed by Ang et al. (2004, 2007). This Culture Intelligence Scale comprises 20 questions developed based on the CQ four-dimension theoretical model. It has been proved to have high reliability and validity by individuals with relevant cross-cultural backgrounds from around the world. The entire scale covers four core dimensions. Each dimension has five questions, with 20 questions in total. Scoring was conducted using a five-point Likert scale. Each number represents a degree to which the description in an item conforms to the fact, where "1" means "absolute non-conformity", "2" means "moderate non-conformity", "3" means "uncertainty", "4" means "moderate conformity", and "5" means "absolute conformity".

3.2.2 Employee Creativity Scale

Employee creativity was measured based on the Employee Creativity Scale developed by Zhou & George (2001). Scoring was conducted using a five-point Likert scale. Each number represents a degree to which the description in an item conforms to the fact, where "1" means "absolute non-conformity", "2" means "moderate non-conformity", "3" means "uncertainty", "4" means "moderate conformity", and "5" means "absolute conformity".

3.2.3 Selection of control variables

We chose age group and whether a respondent has overseas study experience as demographic variables of the questionnaire. The previous studies found that, the aforesaid two variables are often used as control variables in studies concerned with cultural intelligence and employee creativity. For instance, Ang et al. (2007) regarded gender, age, and cross-cultural experience as factors influencing cultural intelligence, and also as control variables to analyze the relationship between cultural intelligence and cultural adaptation, decision-making, and work performance. Fu Jia (2007) added another factor - language proficiency based on the foregoing factors, and found that foreign language proficiency, as with other factors, has great impact on cultural intelligence. We provided five options i.e. "younger than 18 years old", "aged 18 to 25 years old", "aged 26 to 30 years old", "aged 31 to 40 years old", and "older than 41 years old" under the "Age Groups" item, and two options ("1": "Yes"; "2": "No") under the item of "Whether a respondent has overseas study experience?".

4. DATA ANALYSIS

Cultural intelligence comprises four dimensions, i.e. Metacognitive CQ, Cognitive CQ, Motivational CQ, and Behavioral CQ. According to the requirement of regression analysis, it is

necessary to test whether multicollinearity occurs among data before regression analysis on such data. Excessively strong correlation among variables interferes with the results of regression analysis. The testing result showed that, since the variance inflation factor (VIF) values of main variables were less than 10, multicollinearity did not exist and multiple regression analysis was allowed.

In order to study the specific influence of the four CQ dimensions on employee creativity, we adopted hierarchical regression analysis method with employee creativity as dependent variable, each of four CQ dimensions (i.e. Metacognitive CQ, Cognitive CQ, Motivational CQ, and Behavioral CQ) as independent variable, and each group of age as control variable. The results are shown in Table 1, Table 2, Table 3 and Table 4 .

4.1 Impact of Metacognitive CQ on employee creativity

Table 1 shows the results of multiple regression after independent variable - employee creativity is added based on Model 2. The results showed that, Model 1 represented the influence of control variable on employee creativity; after the adjustment, the R-squared (R^2) value was 0.163 and F-value was significant at 0.001 level of significance (F=21.084***) in Model 2; the regression model had good global fitting effect and could interpret the overall variation of employee creativity by 16.3%; after Metacognitive CQ was added, model interpretability rose to a certain extent. The Metacognitive CQ regression factor was 0.257 and p-value was less than 0.001 (sig=0.000). Such results showed that, Metacognitive CQ had significantly positive impact on employee creativity, verifying hypothesis H1. The results are shown in Table 1 as follows:

Table 1: Impact of Metacognitive CQ on Employee Creativity

	Model 1 Dependent variable: employee creativity		Model 2 Dependent variable: employee creativity	
	Beta	VIF	Beta	VIF
Control Variable				
Age Groups	.230***	1.060	.195***	1.078
Whether a respondent has overseas study experience or not	.183**	1.060	.175**	1.061
Independent Variable				
Metacognitive CQ	--	--	.257***	1.021
R^2		.106***		.171***
Adj.R_2		.100***		.163***

F		18.292**	21.084***
ΔR_2			.065***
ΔF			23.943***

Note:*P<0.05，**P<0.01，***P<0.001

4.2 Impact of Cognitive CQ on employee creativity

Table 2 shows the results of multiple regression after independent variable - employee creativity is added based on Model 4. The results showed that, Model 3 represented the influence of control variable on employee creativity; after the adjustment, the R-squared (R^2) value was 0.113 and F-value was significant at 0.05 level of significance (F=16.534***) in Model 4; the regression model had good global fitting effect and could interpret the overall variation of employee creativity by11.3%; after Cognitive CQ was added, model interpretability rose to a certain extent. The Cognitive CQ regression factor was 0.125 and p-value was less than 0.001 (sig=0.000). Such results showed that, Cognitive CQ had significantly positive impact on employee creativity, verifying hypothesis H2. The results are shown in Table 2 as follows:

Table 2: Impact of Cognitive CQ on Employee Creativity

	Model 3 Dependent variable: employee creativity		Model 4 Dependent variable: employee creativity	
	Beta	VIF	Beta	VIF
Control Variable				
Age Groups	.230***	1.060	.227***	1.061
Whether a respondent has overseas study experience or not	.183**	1.060	.163*	1.086
Independent Variable				
Cognitive CQ	--	--	.125*	1.028
R^2		.106***		.121*
Adj.R_2		.100***		.113*
F		18.292**		16.534*
ΔR_2				.015*
ΔF				14.137*

Note:*P<0.05，**P<0.01，***P<0.001

4.3 Impact of Motivational CQ on employee creativity

Table 3 shows the results of multiple regression after independent variable - employee creativity is added based on Model 6. The results showed that, Model 5 represented the influence of control variable on employee creativity; after the adjustment, the R-squared (R^2) value was 0.154 and F-value was significant at 0.001 level of significance (F=19.758***) in Model 6; the regression model had good global fitting effect and could interpret the overall variation of employee creativity by 15.4%; after Motivational CQ was added, model interpretability rose to a certain extent. The Motivational CQ regression factor was 0.238 and p-value was less than 0.001 (sig=0.000). Such results showed that, Motivational CQ had significantly positive impact on employee creativity, verifying hypothesis H3. The results are shown in Table 3 as follows:

Table 3: Impact of Motivational CQ on Employee Creativity

	Model 5 Dependent variable: employee creativity		Model 6 Dependent variable: employee creativity	
	Beta	VIF	Beta	VIF
Control Variable				
Age Groups	.230***	1.060	.221***	1.062
Whether a respondent has overseas study experience or not	.183**	1.060	.158*	1.070
Independent Variable				
Motivational CQ	--	--	.238***	1.014
R^2		.106***		.162***
Adj.R_2		.100***		.154***
F		18.292***		19.758***
ΔR_2				.056***
ΔF				20.387***

Note:*P<0.05，**P<0.01，***P<0.001

4.4 Impact of Behavioral CQ on employee creativity

Table 4 shows the results of multiple regression after independent variable - employee creativity is added based on Model 8. The results showed that, Model 7 represented the influence of control variable on employee creativity; after the adjustment, the R-squared (R^2) value was 0.165 and F-value was significant at 0.001 level of significance (F=21.419***) in Model 8；the regression

model had good global fitting effect and could interpret the overall variation of employee creativity by 16.5%; after Behavioral CQ was added, model interpretability rose to a certain extent. The Behavioral CQ regression factor was 0.263 and p-value was less than 0.001 (sig=0.000). Such results showed that, Behavioral CQ had significantly positive impact on employee creativity. The result also showed that, since the VIF values of main variables in each regression model were less than 10, multicollinearity did not exist for main variables in regression model. Behavioral CQ had significantly positive impact on employee creativity, verifying hypothesis H4. The results are shown in Table 4 as follows:

Table 4: Impact of Behavioral CQ on Employee Creativity

	Model 7 Dependent variable: employee creativity		Model 8 Dependent variable: employee creativity	
	Beta	VIF	Beta	VIF
Control Variable				
Age Groups	.230***	1.060	.191***	1.083
Whether a respondent has overseas study experience or not	.183**	1.060	.165*	1.065
Independent Variable				
Behavioral CQ	--	--	.263***	1.032
R^2		.106***		.173***
Adj.R_2		.100***		.165***
F		18.292**		21.419***
ΔR_2				.067***
ΔF				24.842***

Note:*P<0.05，**P<0.01，***P<0.001

5. CONCLUSION AND DISCUSSION

5.1 Conclusion

Through the analysis of 311 valid sample data, explore the relationship between Cultural Intelligence and Employee Creativity. Table 5 presents descriptive statistics of demographic data. Table 6 presents descritptive statistics of the variables.

Table 5: Descriptive statistics

Properties		Number of people	Percentage（%）
Age Groups	younger than 18 years old	3	1.0
	aged 18 to 25 years old	111	35.7
	aged 26 to 30 years old	101	32.5
	aged 31 to 40 years old	86	27.7
	older than 41 years old	10	3.2
Gender	male	148	47.6
	female	163	52.4
Educational status	Junior high school or below	10	3.2
	High school	29	9.3
	junior college	99	31.8
	bachelor's degree	151	48.6
	Master degree or above ;	22	7.1
Overseas experience	yes	218	70.1
	no	93	29.9

In our study, age groups and overseas experience have a positive influence on Cultural Intelligence and Employee Creativity. This result is similar to the research conclusions of Ang et al. (2007) and Fu Jia (2007) .

Table 6: Means, Standard Deviations, and Correlations

	Mean	SD	1	2	3	4	5	6	7	8
1. Age Groups	2.96	.89								
2. Gender	.52	.50	-.124*							
3. Educational status	3.47	.87	.066	.128*						
4. Overseas experience	1.30	.45	.238**	-.010	.051					
5. Metacognitive CQ	3.82	.69	.141*	-.091	.266**	.061				
6. Cognitive CQ	3.16	.75	.064	-.064	.118*	.164**	.429**			
7. Motivational CQ	3.67	.66	.063	-.025	.133*	.111	.523**	.519**		
8. Behavioral CQ	3.59	.69	.164**	-.063	.082	.102	.505**	.428**	.556**	
9. Employee Creativity	3.58	.70	.273**	-.142*	.111	.237**	.295**	.166**	.269**	.311**

According to Minglong Wu (2013), the correlation coefficient of variables is less than 0.7, which can be considered that there is no collinear problem. From table 6, it can be seen that the

correlation coefficient of variables is less than 0.7, that is, there is no collinear problem, and regression analysis can be performed.

This study verified the hypotheses of relationship between cultural intelligence and employee creativity. The verification results showed that, cultural intelligence has significantly positive impact on employee creativity in multiple dimensions. This cross-cultural study aimed to reveal the psychological mechanisms through which creativity is generated via investigation on the cultural factors that influence the generation and improvement of creativity. Improvement of cultural intelligence contributes to the rise of employee creativity. It is helpful in the understanding of individual creativity from a cultural dimension by breaking the previous practices of interpretation on creativity at a single dimension. The study showed that, cultural intelligence may be regarded as an antecedent variable of employee creativity. This finding is of great significance to the study on employee creativity. The study further verified the impact of four CQ dimensions (Metacognitive CQ, Cognitive CQ, Motivational CQ, and Behavioral CQ) on employee creativity and found that, each CQ dimension comprises numerous sub-dimensions, which have great impact on generation of creativity. This finding coincides with the Three-Facet Model of Creativity developed by Sternberg (2003). Furthermore, it suggested that we can focus on the impact of individual psychological resources on employee creativity, which further improves employee creativity. It is also consistent with the logic of investment theory of creativity developed by Sternberg and Lubart (2003), i.e. creativity requires a confluence of psychological resources including intelligence, knowledge, thinking style, personality, motivation and environment. This study proves that intelligence is a factor to influence the generation of creativity.

5.2 Discussion

This study verifies that the four dimensions of Cultural Intelligence are positively correlated with Employee Creativity. This result is similar to the research conclusions of Scott (1994), Sagive (1995), De Stobbelir (2013), Cerne (2015) et al., that is Metacognitive CQ, Cognitive CQ, and Behavioral CQ are positively correlated with Employee Creativity. In addition, this study also verifies that Motivational CQ is positively correlated with Employee Creativity, which is a supplement to previous studies. This paper verifies that the dimensions of Cultural Intelligence can be the pre-dependent variables of Employee Creativity, and there is a correlation between Cultural Intelligence and Employee Creativity.

Management science studies human being, more specifically human behaviors. Cultural intelligence reflects human psychology and personality while employee creativity mirrors human behaviors. Organizations may enhance their employees' creativity by improving cultural

intelligence. The results indicated that, cultural intelligence has positive impact on employee creativity in multiple dimensions. Therefore, organizations may enhance their employees' creativity by improving cultural intelligence. In view of the fact that cultural intelligence is affected by a number of factors such as age, cross-cultural experience, etc., organizations may provide cross-cultural trainings for and assign tasks to employees in different groups of age. For instance, employees may be dispatched to visit various enterprises in different areas for learning, exchange of ideas, or for business trip, or even organized for travel on a regular basis. All these create more opportunities for employees to get in touch with different cultural environment, obtain joyful experience from cross-cultural exchange, and ultimately inspire their own creativity.

6. LIMITATION AND PROSPECT

6.1 Limitation

For the purpose of the study, we collected samples from the Guangxi Zhuang Autonomous Region, China, primarily from Baise City, due to limited time, energy, and social resources. Guangxi is a province located in the Southwest border area of China which is economically backward. Particularly Baise is an area with identical features to old revolutionary base areas, regions inhabited by ethnic groups, border areas, mountainous regions, and poverty-stricken areas. For this reason, employees here are less initiative. However, Baise boasts its simpler folkway than coastal areas. Enterprises in Guangxi and their employees must have been influenced by the aforesaid environment. Therefore, the applicability of this conclusion to other areas of China needs to be proved since the results of this study were obtained based on the data collected in Guangxi.

Moreover, the study employed cross-section analyzing approach, which means that all the data is collected within a specific time frame. Such data has less interpretability for causal relationship than they do for correlation among variables.

6.2 Prospect

In consideration of the limitation of this study, further studies may be conducted in the following aspects:

(1)   Sampling may be conducted in different areas with their own distinct characteristics based on the design of this study, to observe if the results are significant and to analyze the impact of a particular regional scenario on the relationship between capital and employee creativity.

(2)   Longitudinal approach may be considered in similar studies in the future. Longitudinal study tracks the objects to collect longitudinal data, allowing that the causal relationship of the objects of study is tested in a more rigorous manner.

REFERENCES

Ang, S. & Inkpen, A. C. (2008). Cultural intelligence and offshore outsourcing success: A framework of firm-level intercultural capability. *Decision Sciences*, 39, 337-358.

Amabile, T. M. (1966). Creativity in context. Boulder. *CO: Westview Press.*

Amabile, T. M .& Conti, H. (1999). Changes in the Work Environment for Creativity during Downsizing. *Academy of Management Journal*, 42,630-640.

Amabile, T. M. (1997). Motivating Creativity in Organizations: On Doing What You Love and Loving What You Do. *California Management Review*, 40(1), 39-60.

Ekela, C. & Grossman, P.(2005). Managing diversity by creating team identity. *Journal of Economic Behavior & Organization,* 58,371-392.

Earley, P. C. & Ang, S. (2003). Cultural intelligence: Individual interactions across cultures . *Palo Alto, Calif: Stanford University Press* .

Glaser, B.G. (1978). Theoretical Sensitivity: Advances in the Methodology of Grounded Theory. Mill Valley ,*CA: Sociology Rress.*

Krri, Anne, & Crowne. (2008).What leads to cultural intelligence. *Business Horizons,* 51,391-399.

Liu. D. &, Chen, X.P. & Yao, X. (2011). From antonomy: A multilevel investigation of the mediating role of harmonious passion. *Journal of Applied* Psychology ,96(2),294-309.

Luthans, F., Avolio, B. J., Walumbwa, F. O. & Li ,W. (2005). The psychological capital of Chinese works: Exploring the relationship with performance. *Management and Organization Review*, 1,249-271.

Luthans, F., Youssef, C. M. & Avolio, B. J. (2007). Psychological capital (C. P. Li, Trans.). *New York: Oxford University Press, Beijing: China Light Industry Press.*

Moon, T. (2010). Organizational Cultural Intelligence: Dynamic Capability Perspective. *Group & Organization Management*, 35, 456-458.

Oldham, G. R. & Cummings, A. (1996). Employee Creativity: Personal and Contextual Factors at Work. *Academy of Management Journal*, 39, 607-634.

Rhodes, M. (1961). An analysis of creativity. In frontiers of creativity research: Beyond the basics. *Buffalo, NY: Bearly*, 216-222.

Scott, S. G.& Bruce, R. A.(1994). Determinants of Innovative Behavior: A Path Model of Individual Innovation in the Workplace. *Academy of Management Journal* , 37(3), 580-607.

Simontion, D. K. (1995). Creativity: cognitive, personal, developmental, and social aspects. *American Psychologist*, 55,151-158.

Shalley, C. E.& Gilson, L. L.(2004). What Leaders Need to Know: A Review of Social and Contextual Factors that Can Foster or Hinder Creativity. *Leadership Quarterly* , 15, 33-53.

Shalley, C. E. & Zhou, J.& Oldham, G. R.(2004). The Effects of Personal and Contextual Characteristics on Creativity: Where Should We Go from Here. *Journal of Management* , 30, 933-958.

Shalley, C. E. (1995).Effects of Coaction, Expected Evaluation, and Goal Setting on Creativity and Productivity. *Academy of Management Journal* , 38: 483-503.

Tierney, P. & Farmer, S. M. & G.B. (1999). An examination of leadership and employee creativity：The relevance of traits and relationships. *Personnel Psychology*,52,591-620.

Tierney, P. & Farmer, S. M. & G. B. (1999). An examination of leadership and employee creativity：The relevance of traits and relationships. *Personnel Psychology*,52,591-620.

Tierney, P. (2004). The Pygmalion Process and Employee Creativity. *Journal of Management*, 30 (3), 413-432.

Woodman, R. W., Sawyer, J.E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review*,18(2),293-321.

Zhou, J. (2003). When the presence of creative coworkers is related to creativity: Role of supervisor close monitoring, developmental feedback, and creative personality. *Journal of Applied Psychology*, 88, 413-422.

Zhou, J. & George, J. M. (2001). When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management Journal*,44(4), 682-696.