



# Linking personality to cultural intelligence: An interactive effect of openness and agreeableness



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## ABSTRACT

The personality trait of openness is generally believed to influence an individual's cultural intelligence, which is an ability to deal effectively with people from different cultural backgrounds. This study examines whether a relationship between the two depends on the individual's degree of agreeableness, a personality trait important for building interpersonal relationships. Data collected from 244 international professionals shows that openness is positively related to three facets of cultural intelligence when agreeableness is high, but not when agreeableness is low. The findings suggest that research on personality and cultural intelligence would benefit from an interactive approach, and that assessment, selection and development of international talents should consider personality traits not in isolation, but in concert.

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## 1. Introduction

In today's globalized world, individuals need to develop *cultural intelligence* (CQ) to adapt more effectively to a new cultural setting where people think and behave differently (Kim, Yamaguchi, Kim, & Miyahara, 2015; Ward, Wilson, & Fischer, 2011). CQ is conceptualized as a type of intelligence which reflects an individual's ability to deal effectively with people from different cultural backgrounds (Earley & Ang, 2003). Construct validity and discriminative validity of CQ have been established in various cultural contexts (Ang et al., 2007; Şahin, Gürbüz, Köksal, & Ercan, 2013) and its antecedents and nomological network have been widely studied (e.g., Ang, Van Dyne, & Koh, 2006; Ang et al., 2007; Li, Mobley, & Kelly, 2013). Five factor personality traits are established as determinants of CQ (Ang et al., 2006). However, no attention has been paid to how personality traits interact to influence CQ. Without this knowledge, we do not fully understand the vital role of personality traits in culturally competent individuals to guide the assessment, selection and development of international talents. Therefore, departing from the dominant emphasis of previous studies on independent five factor personality traits and individual's competencies to be effective in an international context, this study examined an interactive effect of openness and agreeableness personality traits on CQ.

While intelligence is commonly defined in terms of generalized adaptation to the environment (Sternberg, 1999), CQ is a unique intelligence for adaptation to cultural environment hence helps us understand why some individuals are more effective than others in culturally diverse situations (Thomas et al., 2015). Following Sternberg's (1986) multiple-facets framework of intelligence, CQ is conceptualized as a multidimensional construct including metacognitive, cognitive, motivational and behavioral dimensions (Earley & Ang, 2003). *Metacognitive CQ* refers to the processes of 'thinking about thinking' that individuals use to acquire and understand cultural knowledge and make sense of intercultural experiences. *Cognitive CQ* is a person's ability to understand both similarities and differences among cultures; and to do so requires general knowledge structures and mental maps about different cultures (Ang et al., 2006). *Motivational CQ* refers to a person's interest in experiencing other cultures and a belief that they can function effectively in a different cultural environment (Ang et al., 2006). *Behavioral CQ* is a person's ability to acquire or adapt behaviors appropriate for a new culture (Earley & Peterson, 2004).

Despite the criticism about the multi-facets theory of intelligence (e.g., Gottfredson, 2003), a theory based CQ concept continues to develop (e.g. Thomas, 2006, Thomas et al., 2015). CQ measurements, by far predominantly self-report instruments similar to psychometric measurements of other types of intelligence, their validity and reliability continue to improve (e.g. Ang et al., 2007, Thomas et al., 2015). Hence research about CQ has generated ample evidence of the uniqueness of CQ construct and its outcomes. It has been found not to be correlated with general intelligence (IQ), but correlated with emotional

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intelligence (EQ) (Moon, 2010; Rockstuhl, Seiler, Ang, Van Dyne, & Annen, 2011). CQ and IQ are important for cross-cultural leadership while EQ and IQ are important for domestic leadership (Rockstuhl et al., 2011). CQ enhances learning from international experience (Ng, Van Dyne, & Ang, 2009), cultural judgment (Ang et al., 2007), and intercultural negotiation (Imai & Gelfand, 2010), and it enables managers to lead multicultural teams and organizational innovation more effectively (Elenkov & Manev, 2009; Groves & Feyerherm, 2011). It is crucial for global organizations to select and develop talents with higher levels of CQ or higher potential to develop CQ in order to remain competitive in an ever more challenging global environment (Triandis, 2006).

The five independent personality factors were found to correlate with CQ dimensions (Ang et al., 2006). More specifically, significant links were found between conscientiousness and metacognitive CQ; agreeableness and emotional stability with behavioral CQ; extraversion with cognitive, motivational, and behavioral CQ; and openness with all four factors of CQ (Ang et al., 2006). Although the five-factor model has come to be considered as the most frequent representation of personality trait structure (Costa & McCrae, 1992a; Robert R McCrae & Costa, 1997; Robert R. McCrae & John, 1992), personality traits do not exist in a vacuum, but co-exist within individuals along with other traits (Merz & Roesch, 2011; Penney, David, & Witt, 2011). The interactive effects of personality traits were found to predict job performance and behavior beyond the additive effect of the five factors individually (Hofstee, Martin, Moor, & Pervin, 2012; King, George, & Hebl, 2005; Pease & Lewis, 2015; Witt, Burke, Barrick, & Mount, 2002). This study examines the interactive effect of personality traits on CQ with a focus on openness and agreeableness based on social learning theory.

Social learning theory proposes that individuals develop through learning from people around them (Bandura, 1971) and CQ is developed from reacting to external cultural stimuli and learning from the interaction with people from different cultures (Li et al., 2013; Thomas & Inkson, 2005). Hence agreeableness, a personality trait that relates to interpersonal competency (Witt et al., 2002), is vital for CQ. To date, the most critical personality trait that relates to CQ is deemed to be openness (Ang et al., 2006; Triandis, 2006). However, open individuals who are low on agreeableness are less likely to learn from culturally different others in comparison with open individuals who are high on agreeableness due to their lower level of interpersonal competencies. Agreeableness is also highly correlated with cultural empathy (Leone, Van der Zee, van Oudenhoven, Perugini, & Ercolani, 2005), which is the individual's ability to empathize with the feelings, thoughts and behaviors of members from different cultural groups; so high agreeableness is important for not only behavioral CQ but also for metacognitive CQ and cognitive CQ. However, these relationships have not been established in previous research. The role of agreeableness on CQ may rest in interaction with openness personality trait. We anticipate that the positive relationship between openness and the four facets of CQ is stronger when agreeableness is high than when it is low.

## 2. Method

### 2.1. Participants

Participants involved two hundred and forty-four international professionals including international managers and international MBA students. All had exposure to different cultures through work, education or other international experiences. The average age was 32.2 years. Males accounted for 55% of the sample. Ninety-six percent of the sample held a bachelor or postgraduate degree. Participants represented multiple nationalities and were from various occupational functions and positions.

#### 2.1.1. Cultural intelligence

The 20-item rated on a 7-point scale inventory developed by Ang et al. (2007) was employed to measure CQ. The inventory contains four items for measuring Metacognitive CQ, six items for Cognitive CQ,

five items for Motivational CQ and five items for Behavioral CQ. In this study, internal consistency ( $\alpha$ ) values for the four facets of CQ are 0.75, 0.83, 0.76, and 0.74 respectively. We used confirmatory factor analysis to test the construct validity of the construct. The residual of the items for different targets was allowed to covary. The final model showed a good fit (CMIN = 319.048; df = 141; AGFI = .83; CFI = .90; RMSEA = .07).

#### 2.1.2. Personality

The NEO Five Factor Inventory (NEO-FFI) published by Psychological Assessment Resources, Inc. was employed to assess the five factors of personality. In comparison with other instruments, the NEO-FFI personality inventory has the major advantage of providing a more precise assessment of the five-factor model domains and underlying facets. It contains 60 items which are rated on a 5-point scale. In this study, the scales show internal consistency values 0.82, 0.75, 0.63, 0.69 and 0.82 for emotional stability, extraversion, openness, agreeableness, and conscientiousness respectively.

#### 2.1.3. Control variables

Following previous studies about CQ (e.g. Ang et al., 2006, Li et al., 2013), gender, age, educational background, country of birth, and length of overseas work experience were included as control variables in the analysis. Gender is coded as "0" for male and "1" for female. Education is measured by the level of education (1 – Did not complete high school, 2 – High school, 3 – Bachelor, 4 – Master Degree, 5 – PhD degree or equivalent level graduate degree). Country of birth is measured by clustering reported countries of birth that are represented in the sample to "0" if they are Western countries and "1" if they are Eastern countries. Length of overseas work experience is measured by months the participants had worked overseas.

## 3. Results

Means, standard deviations, and correlations are reported in Table 1. Gender and education were each correlated with three facets of CQ and age was not correlated with any facets of CQ. Length of overseas work experience was correlated with cognitive CQ and motivational CQ. Openness was positively correlated with all four facets of CQ and agreeableness was not correlated with any CQ facet.

We employed moderated multiple regression analysis (Aiken & West, 1991) using SPSS software. Firstly, we mean centered the variables associated with the interaction terms. Then we ran four independent moderated multiple regression analyses for each of the four CQ facets. The Variance Inflation Factor (VIF) and homoscedasticity of residuals were also examined. Three models were tested under each moderated multiple regression analysis: the first model consisted of only the control variables; the second model added five personality factors; and the third model added the two-way interaction term Agreeableness  $\times$  Openness.

Table 2 contains a summary of the results of the moderated multiple regression analyses of the main effect of independent five personality traits and interaction effect of openness and agreeableness. The VIF values of the variables for all regression models were between 1.01 and 1.32, indicating that multicollinearity was not a concern. No heteroscedasticity was detected by graphical procedure. Models 3, 6 and 12 in Table 2 indicate that Openness  $\times$  Agreeableness was positive and significant for Metacognitive CQ ( $r = 0.12$ ,  $p < .05$ ), Cognitive CQ ( $r = 0.12$ ,  $p < .05$ ) and Behavioral CQ ( $r = 0.17$ ,  $p < .01$ ). Effect sizes of Cohen's  $f^2$  are 0.017, 0.017 and 0.033 respectively for the three models in comparison with Models 2, 5 and 11 in Table 2. They are medium to large based on Kenny (2015) given that the average effect size in tests of moderation multiple regression analysis published in leading journals is only 0.009 to 0.017, and a median of 0.002 to 0.003 (Aguinis, Beaty, Boik, & Pierce, 2005). Furthermore, Model 9 in Table 2 indicates that Openness  $\times$  Agreeableness was not significant for Motivational CQ,

**Table 1**

Mean, standard deviations and intercorrelations for all variables used in this study (N = 244).

S/N	Variable	Mean	S.D.	$\alpha$	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Gender	.45	.50		1													
2	Age	32.17	7.15		-.158*	1												
3	Education	3.54	.69		-.139*	.189**	1											
4	Country of birth	.60	.49		.140*	-.152*	-.011	1										
5	Length of overseas work experience	20.57	44.28		-.103	.339**	.104	-.311**	1									
6	Emotional stability	30.67	7.22	0.82	-.109	-.078	-.147*	.045	-.040	1								
7	Extraversion	43.25	6.20	0.75	-.030	-.048	-.046	-.161*	-.032	.443**	1							
8	Openness	41.14	5.53	0.63	.039	.156*	-.073	-.343**	.141*	.069	.224**	1						
9	Agreeableness	43.24	5.44	0.69	.128*	.086	.017	-.068	-.067	.234**	.170**	.197**	1					
10	Conscientiousness	46.69	6.09	0.82	-.077	-.003	-.004	.080	-.015	.461**	.247**	-.042	.146*	1				
11	Metacognitive CQ	21.13	3.60	0.75	-.154*	.009	.209**	-.143*	.091	.137*	.168**	.146*	.017	.212**	1			
12	Cognitive CQ	26.01	6.12	0.83	-.021	.086	.306**	-.066	.185**	.053	.038	.137*	.075	.018	.550**	1		
13	Motivational CQ	27.03	4.36	0.76	-.137*	.056	.174**	-.271**	.257**	.179**	.278**	.233**	.111	.163*	.561**	.528**	1	
14	Behavioral CQ	25.50	4.37	0.74	-.141*	-.029	.075	-.212**	.078	.133*	.141*	.198**	-.010	.247**	.671**	.448**	.550**	1

Note. CQ = cultural intelligence.  
Two tailed test. \*p < .05. \*\*p < .01.

**Table 2**

Moderated multiple regression analysis (n = 244).

Variable	Metacognitive CQ			Cognitive CQ			Motivational CQ			Behavioral CQ		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Gender	-0.12	-0.11	-0.10	0.04	0.01	0.02	-0.08	-0.09	-0.08	-0.14 *	-0.14 *	-0.13 *
Age	-0.08	-0.09	-0.10	-0.02	-0.04	-0.06	-0.08	-0.10	-0.10	-0.09	-0.11	-0.12
Education	0.20 **	0.23 ***	0.23 ***	0.30 ***	0.32 ***	0.31 ***	0.16 *	0.18 **	0.18 **	0.09	0.12	0.11
Country of birth	-0.12	-0.08	-0.08	-0.02	0.03	0.03	-0.21 ***	-0.13 *	-0.13 *	-0.19 **	-0.14 *	-0.15 *
Length of overseas work experience	0.05	0.05	0.05	0.16 *	0.17 *	0.16 *	0.19 **	0.21 ***	0.21 ***	0.04	0.04	0.04
Emotional stability		0.06	0.05		0.05	0.04		0.04	0.04	0.04	0.04	0.02
Extraversion		0.10	0.11		0.03	0.04		0.21 **	0.21 **	0.04	0.05	0.05
Openness		0.14 *	0.14 *		0.14 *	0.13 *		0.14 *	0.14 *	0.19 **	0.18 **	0.18 **
Agreeableness		-0.03	-0.04		0.06	0.05		0.06	0.06	-0.04	-0.04	-0.04
Conscientiousness		0.22 ***	0.24 ***		0.03	0.05		0.14 *	0.15 *	0.23 ***	0.25 ***	0.25 ***
Openness × Agreeableness			0.12 *		0.12 *				0.08		0.17 **	0.17 **
F	4.22 ***	4.36 ***	4.38 ***	6.43 ***	3.93 ***	3.97 ***	7.70 ***	7.39 ***	6.91 ***	4.05 **	4.37 ***	4.79 ***
$\Delta F$		4.22 ***	4.05 *		1.38	3.88 *		6.23 ***	1.85		4.40 ***	7.70 **
R <sup>2</sup>	0.08	0.16	0.17	0.12	0.14	0.16	0.14	0.24	0.25	0.08	0.16	0.18
$\Delta R^2$		0.08	0.01		0.03	0.01		0.10	0.01		0.08	0.03

Note. CQ = cultural intelligence.  
Two tailed tests. \*p < .05. \*\*p < .01. \*\*\*p < .001.

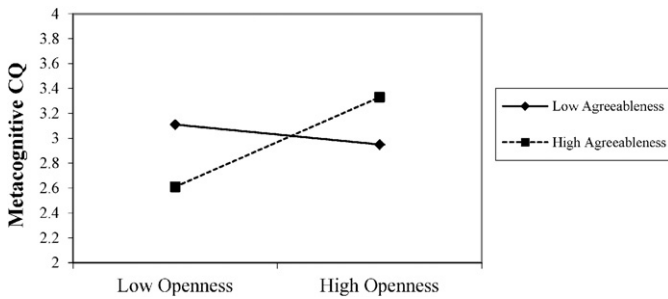


Fig. 1. Interaction effect of openness and agreeableness on metacognitive CQ.

To further probe the results, we plotted the interaction effects as shown in Figs. 1, 2, and 3. Simple slopes suggested that when agreeableness is high, openness is positively related to metacognitive CQ (simple slope = 0.172,  $t = 2.944$ ,  $p = 0.004$ ,  $d = 0.387$ ), cognitive CQ (simple slope = 0.289,  $t = 2.878$ ,  $p = 0.004$ ,  $d = 0.379$ ) and behavioral CQ (simple slope = 0.059,  $t = 4.025$ ,  $p = 0.000$ ,  $d = 0.529$ ). Effect size  $d$  for behavioral CQ is large and the other two are medium based on Cohen (1988). However, when agreeableness is low, simple slopes suggest no relationship between openness and metacognitive CQ (simple slope = 0.012,  $t = 0.203$ ,  $p = 0.839$ ,  $d = 0.027$ ), cognitive CQ (simple slope = 0.020,  $t = 0.196$ ,  $p = 0.845$ ,  $d = 0.026$ ) and behavioral CQ (simple slope = 0.004,  $t = 0.249$ ,  $p = 0.803$ ,  $d = 0.033$ ).

#### 4. Discussion

The results which suggest that there is a positive relationship between openness and three facets of CQ when agreeableness is high, and this relationship is weakened or nearly zero when agreeableness is low, offer new insights or alternative explanations about the effect of personality traits on an individual's ability to deal effectively with people from different cultural backgrounds. Rather than treating personality traits as independent, it is meaningful for scholars and organizations alike to consider the interaction of personality traits when evaluating individuals' potential to succeed in an international setting.

Our results suggest a more critical evaluation of the role of openness personality. Openness has been recognized as the most vital personality trait for CQ (Ang et al., 2006; Triandis, 2006). However, based on our results the positive relationship between openness and CQ does not hold when individuals' agreeableness levels are low. This pattern is consistent across three facets of CQ. Open individuals may not perform well in an international environment if they are low on agreeableness.

Secondly, our findings advance existing knowledge about the effect of agreeableness on an individual's ability to deal effectively with people from different cultural backgrounds. Agreeableness was only related to behavioral CQ based on Ang et al. (2006). In our study, agreeableness does not relate to any facet of CQ independently. However, when agreeableness is considered jointly with openness, it has a stronger effect on

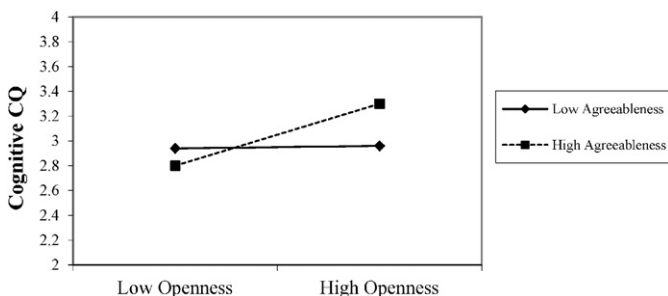


Fig. 2. Interaction effect of openness and agreeableness on cognitive CQ.

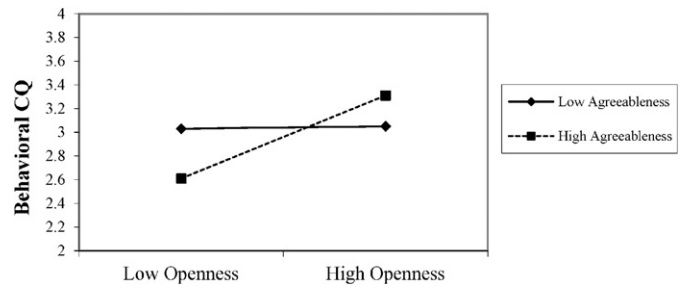


Fig. 3. Interaction effect of openness and agreeableness on behavioral CQ.

three facets of CQ. The results suggest that the influence of agreeableness may need to be considered jointly with other personality traits.

Although agreeable individuals are empathetic, cooperative, interpersonally savvy, and less likely to have reservations when they adapt their behaviors to other cultures, they also tend not to communicate their disagreement with people from other cultures or make constructive suggestions to people from other cultures (LePine & Van Dyne, 2001). This may mean that such individuals run the risk of making efforts to adapt their behaviors to other cultures without effective communication of their own culture and their understanding of the other cultures. Thus, they are perceived by others as exhibiting insincere mimicry and doubtful authenticity. Yet "a high CQ person is a talented mimic who uses mimicry in moderate doses" (Earley & Peterson, 2004). Agreeable individuals need to have the intellectual capacity to determine the what and the why of behaviors that need to be adapted so that they would not simply mimic others' behaviors. To do so, they need to have high openness to new ideas and behaviors, and openly communicate their different opinions in an appropriate manner. The interactive effect of agreeableness with openness can be applied to explain other behaviors in domestic and international contexts in addition to what has been established so far for help behavior (King et al., 2005), counterproductive work behavior (Jensen & Patel, 2011), and job performance (Judge & Erez, 2007; Witt, 2002; Witt et al., 2002).

Understanding the influence of combined personality traits on CQ has important implications for the assessment, selection and development of international talents. With regard to selection, our findings encourage organizations to use a constellation of personality traits in their assessment and selection processes. For international positions, organizations need to consider potential recruits who are high on both openness and agreeableness. With regard to international professionals' personal development, individuals may not realize the benefit of openness without considering their level of agreeableness. Therefore, it is important for them to self-evaluate their personality and understand their innate potential to develop cultural intelligence to establish a feasible developmental plan to develop CQ if they wish to pursue a global career.

#### 4.1. Limitations and future research

The findings of this study are limited by its single source cross-sectional data that was collected through self-report instruments. Current CQ measurements are self-report instruments since individuals can more accurately reflect on their own behaviors than others (Srauger & Osberg, 1981). In order to measure this unique intelligence more accurately, CQ measurements need to include independent evaluations as well. Multiple methods such as the assessment center and 360 degree evaluations from subjects' supervisors or colleagues could be adopted. Longitudinal or experimental designs are also recommended for future studies.

When self-report questionnaires are used to collect data at the same time from the same participants, common method variance can be a concern. Some scholars believe that properly developed multi-trait self-report instruments are resistant to the method variance problem (e.g., Spector, 1987), and others are less supportive of this view



(e.g., Williams, Cote, & Buckley, 1989). For this study, CQ and personality are very different constructs and their measurements also differ. To control common method variance, questions in the survey were randomly ordered, and some items of the NEO-FFI inventory were negatively rated. In addition, recent research found that interaction effects cannot be artifacts of common method variance. Instead, interaction effects can be severely deflated through common method variance, making them more difficult to detect through statistical means (Siemsen, Roth, & Oliveira, 2010). Therefore, common method variance is not a concern when detecting interaction effects in this research.

Since openness has a predominant influence on CQ and learning (Ang et al., 2006; Chamorro-Premuzic & Furnham, 2009), and agreeableness is an important interpersonal personality trait but is not yet well understood in the international literature, this study only examined the influence of the combination of these two personality traits on CQ. Other personality trait interactions may influence CQ as well. Recent research on personality found higher order personality traits and the general factor of personality trait (Linden, te Nijenhuis, & Bakker, 2010), they could also be related to CQ. Overall, the results of this study show a new direction for the study of personality traits for individual effectiveness in an international context.

The differences in the findings of this study and those of Ang et al. (2006) are possibly due to the use of different five-factor instruments. The NEO personality inventories have the major advantage of precision in the assessment of the five-factor model domains and underlying facets (Taylor & MacDonald, 1999; Widiger & Trull, 1997). Although the NEO-FFI is a shortened version of the NEO PI-R for assessing the five-factor model of personality, the reliability and validity efficacy are not affected and it provides for rapid and efficient administration (Costa & McCrae, 1992b). Future studies could also adopt the full version of the NEO PI-R or other personality instruments to examine the independent and interactive effects of personality on CQ and other outcome variables.

#### 4.2. Conclusion

We conclude that the interaction between openness and agreeableness can explain CQ better than the two personality traits in isolation. The most salient role of personality in an individual's ability to deal effectively with people from different cultural backgrounds can only be more fully explained when the unique combination of personality traits is taken into account. The results of this study, in conjunction with other studies (Judge & Erez, 2007; King et al., 2005; Witt, 2002; Witt et al., 2002), suggest that continued attention needs to be given to the interactive effect of personality traits in future research.

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