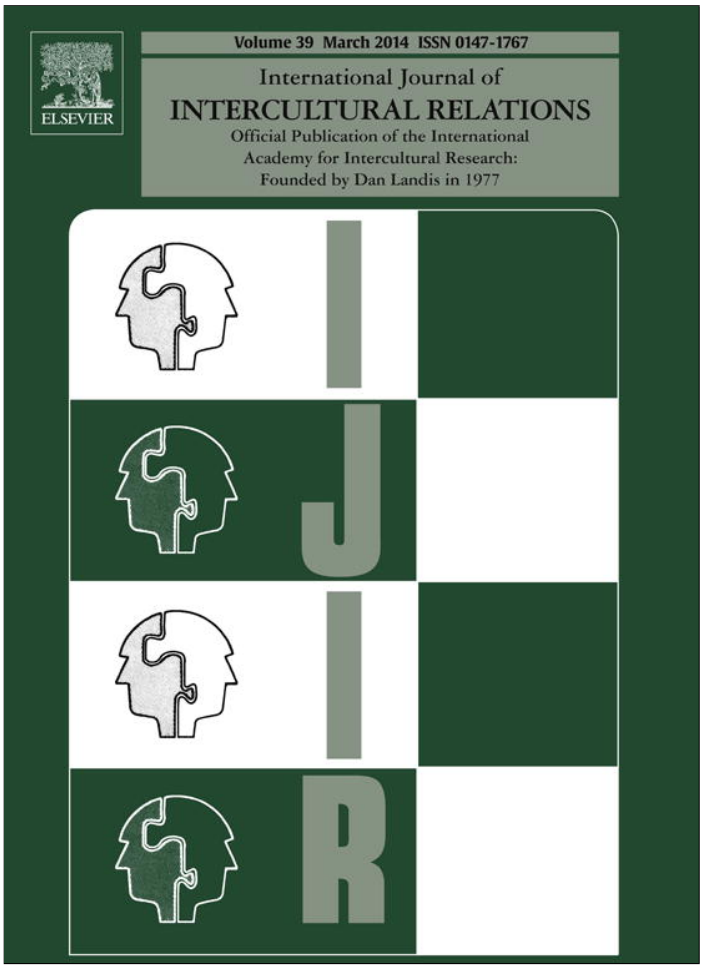

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# Cultural intelligence (CQ) in action: The effects of personality and international assignment on the development of CQ☆

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ABSTRACT

We examined (1) the effect of international assignments on the development of cultural intelligence – CQ over time (2) whether crucial personality traits (i.e., extraversion and openness to experience) had a moderating role in the relationship between international assignments and CQ in a longitudinal design. A total sample of 145 military personnel participated in the study at the beginning of the deployment (Time 1) and 121 persons participated at the end of the deployment (Time 2) in a multinational and multicultural military organization. Repeated measures multivariate analysis of covariance showed that the 6-month international assignment did have a statistically significant effect on the development of all four facets of CQ over time. Moreover, moderated multiple regression analyses demonstrated that individuals who are high on extraversion improved their metacognitive CQ and behavioral CQ more than did individuals who are low on extraversion. Similarly, individuals who are high on openness to experience improved their motivational CQ more than did individuals who are low on openness to experience. Implications for future research and practice are discussed.



## 1. Introduction

Although cultural intelligence (CQ) is a new construct, it has attracted considerable attention worldwide and across diverse disciplines ranging from international management to cross-cultural psychology. Prior research has demonstrated the predictive power of CQ on several beneficial individual and organizational outcomes (Ng, Van Dyne, & Ang, 2012; Van Dyne et al., 2012).

Despite much research indicating that CQ offers great promise as an antecedent to many individual and organizational outcomes, there has been limited research on antecedents of CQ. Ng et al. (2012) reported that antecedents of CQ have been studied in terms of individual differences such as personality traits and prior international experience. Previous research has accumulated important findings on the effects of international experience (e.g., Shannon & Begley, 2008; Tarique & Takeuchi, 2008; Tay, Westman, & Chia, 2008) on CQ. Of the Big Five personality traits, openness to experience was found to be positively related to all factors of CQ (e.g., Ang, Van Dyne, & Koh, 2006; Moody, 2007). However none of these studies, to date, has examined whether personality variables affect the relationship between international experience and CQ over time, despite recent calls for longitudinal research on international experience and CQ (Ng et al., 2012). Given that CQ has been argued to be an important individual capability to function and to manage effectively in cross-cultural contexts (Earley

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& Ang, 2003; Earley & Peterson, 2004), a study examining the effect of personality variables on the relationship between international experience and CQ over time would provide valuable cues for assessing readiness for further international assignments and training needs.

The present study investigates the effect of international assignments on the development of CQ over time. More specifically, we focus on certain personality traits (i.e., extraversion and openness to experience) and examine in a longitudinal design how individuals with these personality traits change their CQ following international assignment.

## 2. Theoretical background and hypotheses

### 2.1. Cultural intelligence and international experience

Earley and Ang (2003) defined cultural intelligence (CQ) as "a person's capability to adapt effectively to new cultural contexts" (p. 59). CQ is conceptualized as a multidimensional construct made up four components: Metacognitive (an individual's consciousness and awareness during intercultural interactions), cognitive (general knowledge about the norms, practices and of a culture), motivational (capability to direct attention and energy toward learning about appropriate responses and functioning effectively), and behavioral CQ (flexibility in exhibiting situationally appropriate verbal and nonverbal actions during intercultural interactions) (Ang & Van Dyne, 2008; Ng & Earley, 2006).

CQ is based on capabilities that can be enhanced through training, experience, and education (Earley & Peterson, 2004; Ng, Van Dyne, & Ang, 2009). According to situated learning theory (Lave & Wenger, 1991), exposure to different cultural environments provides individuals with the social context and authentic activities to learn how to live and work in different cultural environments (Ng et al., 2012). According to Lave and Wenger (1991) learning is "an integral and inseparable aspect of social practice" (p. 31). In a situated learning approach, knowledge, skills and behaviors are learned in social and cultural contexts that reflect how knowledge is obtained and applied in everyday situations (Fox, 2000). Hence, international experience provides knowledge and social context that can affect individuals' CQ. In thinking about international experience and the four factors of CQ, we predict that international work experience is related to all components of CQ.

International experience can influence mental (metacognitive and cognitive) components of CQ. Working and living in other cultures provide individuals with unique cultural consciousness, awareness, and knowledge. Exposure to other cultures offers individuals the opportunity to consciously examine their own cultural assumptions, and to be actively engaged in thinking and reflecting before and during interactions. Moreover, international experience can enhance the appreciation of the similarities between cultures and understanding of how cultures are different through gaining the knowledge of norms, practices, and conventions in other cultures. Individuals with international experience are more aware of the similarities and differences in cultural universals and cultural values which reflect high cognitive CQ. Prior findings have confirmed that international experience is related to mental components of CQ. For example, studies have found that international work experience predicted metacognitive CQ (Shannon & Begley, 2008; Tarique & Takeuchi, 2008) and cognitive CQ (Tarique & Takeuchi, 2008; Tay et al., 2008).

International experience should also relate to motivational CQ. International studies have shown that international work experience can impact expatriates' success in international assignments because experienced individuals are likely to be willing to relocate in different environments (Brett & Reilly, 1988), able to exert more effort (Feldman & Bolino, 2000), work with other individuals from different cultural backgrounds (Richard, 2000), and communicate well with host nationals (Mendenhall & Oddou, 1985). Moreover, prior research has reported that international work experience is positively related to motivational CQ (Shannon & Begley, 2008; Tarique & Takeuchi, 2008).

Finally, international experiences should relate to behavioral CQ. Individuals who live or work in other cultures gain knowledge than can further affect his or her attitudes and behaviors through mental structures (Shannon & Begley, 2008; Tarique & Takeuchi, 2008). Walsh (1995) defined mental structures as a "mental template that individuals impose on an information environment to give it form and meaning" (p. 281). These mental structures have influences on individuals' interpreting and reacting to the information environment which may further facilitate situationally appropriate behavior in diverse cultural settings (Tarique & Takeuchi, 2008).

Previous research has accumulated important findings on the effects of international experience on CQ (Ng et al., 2012). In addition to real life experience, several specific programs (e.g., Fischer, 2011; MacNab, 2012; MacNab & Worthley, 2012) intended to provide individuals with cross-cultural experience have been found useful in the development of CQ. Thus, we predict the following hypothesis.

**Hypothesis 1.** Individuals' levels of metacognitive CQ (H1a), cognitive CQ (H1b), motivational CQ (H1c), and behavioral CQ (H1d) will be higher after the international assignment than at the beginning of the international assignment.

### 2.2. Moderating role of personality

Earley and Ang (2003) conceptualized CQ as a state-like individual difference that can be influenced by trait-like individual differences such as personality traits. To date, several researches (Ang et al., 2006; Moody, 2007; Oolders, Chernyshenko, & Stark, 2008; Ward & Fischer, 2008) indicated that significant relationships exist between specific personality traits and CQ. In general, researchers have concluded that openness to experience (Ang et al., 2006; Caligiuri, 2000; Moody, 2007; Oolders

et al., 2008; Ward & Fischer, 2008) and extraversion (Ang et al., 2006; Moody, 2007) traits are related to CQ. Given the pervasive nature of personality traits on individuals' attitudes and behaviors (Chamorro-Premuzic, 2007), these personality traits may influence the relationship between international experience and CQ. Specifically, personality will affect how individuals perceive cross-cultural environment, thus effecting how they internalize international experience, which further develops CQ. Since, previous studies have demonstrated that openness to experience and extraversion have more relevance to novel and unfamiliar situations (e.g., Ang et al., 2006; Caligiuri, 2000; Moody, 2007; Oolders et al., 2008), but have found inconsistent relationship among CQ and other Big Five personality traits (agreeableness, conscientiousness and emotional stability), we focus on openness to experience and extraversion as potentially important personality traits influencing the relationship between international experience and CQ.

Extraversion is characterized by the need to be in social situations and by having social facility. Individuals who are high in extraversion seek excitement, are active, gregarious, assertive, bold, and adventuresome (Goldberg, 1992; McCrae & Costa, 1999). Extraverts are self-confident and sociable, which means they excel during interpersonal interactions and are very at ease during these interactions (John & Srivastava, 1999). Exposure to new cultural environment offers extroverts opportunities to interact with individuals from different cultural background and learn the knowledge of norms, practices, and conventions in other cultures. Although there is little empirical support for the relation between extraversion and mental ability (Chamorro-Premuzic & Furnham, 2004), Ang et al. (2006) found that extraversion was related to cognitive CQ and Moody (2007) reported significantly positive relationship between extraversion and metacognitive CQ. These findings indicate that being confronted with a variety of experiences in cross-cultural situations extraverts are more likely to examine their own cultural assumptions and values and learn the cultural knowledge. Moreover, those high on extraversion are adventurous and ambitious which implies a tendency to expose themselves to new and unfamiliar situations. Previous research (Ang et al., 2006; Moody, 2007) also suggests a relationship between extraversion and motivational CQ. Finally, extraverts also show a higher tendency to enjoy interpersonal interactions and therefore may display more flexible behavior. This in turn suggests that experiences in cross-cultural environment should lead extraverts to develop their behavioral CQ (Ang et al., 2006). In sum, we propose that international experience will have a greater impact on the development of CQ for individuals who are high on extraversion. Therefore, we predict the following hypothesis.

**Hypothesis 2.** The personality trait extraversion moderates the relationship between international experience and CQ, such that individuals who are high on extraversion are more likely to change their metacognitive CQ (H2a), cognitive CQ (H2b), motivational CQ (H2c), and behavioral CQ (H2d) following international assignment.

Openness to experiences, one of the Big Five personality traits, encompasses broad-mindedness, curiosity, creativity, having wide interest, flexibility of thoughts, and inventiveness (Costa & McCrae, 1995; McCrae & Costa, 1999). Past research has demonstrated that openness to experience is correlated with knowledge-based or 'crystallized' aspects of intellectual ability (Ackerman & Heggestad, 1997; Chamorro-Premuzic & Furnham, 2005). This indicates that individuals high on openness to experience are curious, flexible, unconventional, and trying out new things, and therefore likely to 'invest' in intellectual activities and acquire more knowledge (Ang et al., 2006; Chamorro-Premuzic & Furnham, 2006). Exposure to new and unfamiliar cultural environments provides individuals with cultural consciousness, awareness, and knowledge. Individuals who are high on openness to experience are defined as being intelligent, curious, broad-minded, and versatile. Being confronted with an opportunity to consciously examine their own cultural assumptions and values and learn the knowledge of norms, practices, and conventions in other cultures, individuals who are high on openness to experience are expected to increase their mental components (metacognitive and cognitive) of CQ. It seems likely that individuals who are high on openness to experience are willing to expose themselves to a new and unfamiliar cultural environment that would allow them to satisfy their curiosity and interests. This in turn suggests that experiences in a cross-cultural environment should lead individuals to develop their motivational CQ. Finally, individuals who are high on openness to experience are willing to learn new things, look for new experiences, and regulate their behavior in accordance with novel situations. Hence, international experience offers those with high openness to experience opportunities to add new forms of behavior to their repertoire. Fischer (2011) found that individuals who are high on open-mindedness (similar to openness to experience) were more likely to report increases in motivational CQ following an intercultural training. We propose that international experience will have a greater impact on the development of CQ for individuals who are high on openness to experience. Thus, we predict the following hypothesis.

**Hypothesis 3.** The personality trait openness to experience moderates the relationship between international experience and CQ, such that individuals who are high on openness to experience are more likely to change their metacognitive CQ (H3a), cognitive CQ (H3b), motivational CQ (H3c), and behavioral CQ (H3d) following international assignment.

## 3. Methods

### 3.1. Participants

Participants consisted of military personnel from the Turkish troops who were deployed for a 6-month mission from May to December 2011 at the European Union Force (EUFOR) in Bosnia and Herzegovina. EUFOR is a multinational and multicultural military organization with approximately 1500 troops from 28 nations. The troop contributing nations are 23

members of the European Union (e.g., Austria, Bulgaria, Czech Republic, Finland, France, Germany, Greece, and Hungary) and five non-member of the European Union (Albania, Chile, the Former Yugoslav Republic of Macedonia, Switzerland, and Turkey). The EUFOR has two main goals: (1) to support Bosnia and Herzegovina efforts to maintain the safe and secure environment and (2) to provide capacity-building and training support to the Bosnia and Herzegovina Ministry of Defence and Armed Forces (EUFOR, 2012). The troops conjointly conduct exercises in different training areas, collaborate and work together to achieve the same goal. Located at Camp Butmir in Sarajevo, the troops have opportunities to interact with each other during working time as well as at leisure time. Some units of the EUFOR such as Liaison and Observation Teams have opportunities to interact with local people. Our focus of the current study is on the effect of international assignment and personality on the development of CQ in a multicultural setting. As such, the current study (conducted in a multinational and multicultural military environment) offers an ideal context for testing our hypotheses.

A total of 145 persons participated at the beginning of the deployment (Time 1) and 121 persons participated at the end of the deployment (Time 2) in Bosnia and Herzegovina. We were able to match records from 112 participants across both time points. All 112 participants were male with average age of 32.10 years ($SD = 5.47$). The sample was 50.9% non-commissioned officers and 49.1% officers. Average years of military service was 9.91 ($SD = 5.40$), and 46.4% of the respondents had experiences of military mission abroad more than one time. With respect to education level of the respondents; 67.7% had a bachelor's degree and above (e.g., master's degree), while 32.3% had an associate degree or below.

### 3.2. Procedure

Prior to deployment, all Turkish soldiers attended one-month pre-deployment training and preparation program that trained them to operate and fulfill their tasks at a higher level of effectiveness required for multinational military environment. Given that pre-deployment training and preparation may have a strong and positive impact on intercultural capabilities development (e.g., Deshpande & Viswesvaran, 1992; Littrell, Salas, Hess, Paley, & Riedel, 2006) and may lead more realistic evaluations of one's capabilities (e.g., Fischer, 2011), we measured CQ after pre-deployment training and preparation period.

We secured permission from the Senior National Representative. A list of military members was provided by the chief of personnel office. At the beginning of the deployment, participants completed measures of CQ, the Big Five traits of personality and demographic questions. Surveys were distributed at daily training meetings and then collected in the first week of the deployment (Time 1) at the EUFOR in Bosnia and Herzegovina. Two weeks prior to the end of the deployment (approximately six months after Time 1), we sent the follow up survey containing a cover letter in bulk to the personnel office, accompanied by instructions to distribute the survey to individual persons (Time 2). Participants completed measure of CQ and returned the survey in an addressed envelope to us. Comparisons of the respondents to those who did not complete the survey showed that there is no significant difference on any of the variables.

### 3.3. Measures

*Cultural intelligence*. We measured CQ using Ang et al.'s (2007) 20-item scale. The Turkish version of the CQ scale has been found to be reliable and valid instrument to measure individual's intercultural capabilities (Şahin, Gürbüz, Köksal, & Ercan, 2013). Answers were recorded on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale includes four items for metacognitive facet of CQ (e.g., "I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds"), six items for cognitive facet of CQ (e.g., "I know the cultural values and religious beliefs of other cultures"), five items for motivational facet of CQ (e.g., "I enjoy living in cultures that are unfamiliar to me"), and five items for behavioral facet of CQ (e.g., "I change my verbal behavior (accent, tone) when a cross-cultural interaction requires it"). The reliabilities of the subscales were .90 (Time 1) and .94 (Time 2) for metacognitive CQ, .83 (Time 1) and .90 (Time 2) for cognitive CQ, .89 (Time 1) and .91 (Time 2) for motivational CQ, and .89 (Time 1 and Time 2) for behavioral CQ.

*Personality*. The Big Five traits of personality were measured using the 44-item the Big Five Inventory – BFI (Benet-Martinez & John, 1998). Sumer, Lajunen, and Ozkan (2005) showed that the Turkish version of BFI has good psychometric properties. The scale includes short items that were selected from Big Five prototype definitions. Participants indicated the applicability of characteristics and behaviors to themselves on a five-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale included eight items for extraversion (e.g., "I see myself as someone who is talkative"), nine items for agreeableness (e.g., "I see myself as someone who is considerate to almost everyone"), nine items for conscientiousness (e.g., "I see myself as someone who does things efficiently"), eight items for neuroticism (e.g., "I see myself as someone who worries a lot"), and ten items for openness (e.g., "I see myself as someone who values artistic, esthetic experiences"). The reliabilities of subscales were .87 for extraversion, .89 for agreeableness, .83 for conscientiousness, .86 for neuroticism, and .91 for openness.

To assess the discriminant validity of the constructs measured in this study, we conducted a confirmatory factor analysis (CFA) using covariance matrix and maximum likelihood estimation. Given the sample size and the number of indicators per factors, we used item parcels to conduct CFA procedures (e.g., Little, Cunningham, Shahar, & Widaman, 2002). Results of the proposed nine-factor structure (metacognitive CQ, cognitive CQ, motivational CQ, behavioral CQ, extraversion, agreeableness, conscientiousness, neuroticism, and openness) demonstrated good fit with the data, $\chi^2(288\ df) = 694.25$, $p < .1$; root-mean-square error of approximation = 0.064; standardized root-mean-square residual = 0.084; nonnormed fit

index = .93; (Bentler's) comparative fit index = .92 (Browne & Cudeck, 1993; Hoyle, 1995). To test for the discriminant validity of the constructs, we compared the nine-factor model with several alternative models. Nested model comparisons demonstrated that the nine-factor model was superior to the alternative models. Hence, the fit indices of the nested models showed that personality and CQ were distinct constructs.

## 4. Analyses and results

We conducted different sets of analyses. Given that 46.4% of the respondents in our sample had international experiences, we controlled for this (coded as 0 for individuals who have no prior international experience, 1 for individuals who have prior international experience). Previous research has shown international experience as an important antecedent to CQ (Ng et al., 2012). First, in order to test whether the international assignment improved cultural intelligence, we analyzed data using a repeated measures multivariate analysis of covariance (RM-MANCOVA), with prior international experience as covariate (Tabachnick & Fidell, 1996).

Second, in order to test whether individuals high on openness and extraversion would acquire more CQ, a moderated multiple regression analysis was conducted. Following the steps in analysis performed by Fischer (2011), in the first step, prior international experience was entered as control variable to minimize its spurious effect on the dependent variable. In the second step, we entered any of the CQ dimensions and personality traits at Time 1. Finally, the interaction term between any of the CQ dimensions and personality traits at Time 1 were entered into the regression equation to predict changes in the dependent variable at Time 2. The significant interaction shows that the change in scores of any of the CQ dimensions from Time 1 to Time 2 depends on the level of personality traits at Time 1 (Aiken & West, 1991).

The means, standard deviations, scale reliabilities, and inter-correlations of the variables were presented in Table 1. Means and standard deviations for CQ factors at Time 1 and Time 2 in terms of prior international experience were shown in Table 2.

### 4.1. The effect of international assignment

RM-MANCOVA results indicated that after controlling prior international experience, the six-month international assignment did have a statistically significant effect on metacognitive CQ [$F(1, 110) = 36.16$, $p < .01$, $\eta^2 = .24$], cognitive CQ, [$F(1, 110) = 35.48$, $p < .01$, $\eta^2 = .24$], motivational CQ [$F(1, 110) = 6.30$, $p < .05$, $\eta^2 = .54$], and behavioral CQ [$F(1, 110) = 54.13$, $p < .01$, $\eta^2 = .33$]. The main effect of prior international experience on CQ factors was not significant. However, there was a significant interaction between prior international experience and time for metacognitive CQ [$F(1, 110) = 6.79$, $p < .05$, $\eta^2 = .06$], indicating that time effect was greater for individuals who did not have prior international experience than individuals who had prior international experience.

As a result, findings supported Hypothesis 1 which predicted that individual's levels of metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ would be higher after the international assignment than at the beginning of the international assignment. As is evident from Table 2, the mean change scores of CQ factors were significantly greater for Time 2 than for Time 1.

### 4.2. The effect of personality

To test the prediction that individuals who are high on specific personality traits (i.e., extraversion and openness to experience) are more likely to change their CQ following international assignment; a hierarchical regression was performed. Table 3 presented regression results testing the moderating effect of personality (extraversion and openness to experience) on international assignment effects. The variance inflation factors and results (VIFs < 4) indicated that multicollinearity is not a problem (Aiken & West, 1991; Cohen & Cohen, 1983). Results showed that the interaction terms entered in step 3 accounted for a significant increases in explained variance on metacognitive CQ at Time 2 ($\Delta R^2 = .035$, $F(4, 107) = 71.942$, $p < .001$), motivational CQ at Time 2 ($\Delta R^2 = .028$, $F(4, 107) = 22.684$, $p < .001$) and behavioral CQ at Time 2 ($\Delta R^2 = .025$, $F(4, 107) = 44.788$, $p < .001$). The interaction effects were shown in Figs. 1–3.

As hypothesized, Fig. 1 revealed that individuals who are high on extraversion improved their metacognitive CQ more than did individuals who are low on extraversion. The slope in Fig. 1, was significantly steeper for individuals who are high on extraversion ($\beta = .87$, $t = 14.01$, $p < .001$) compared to those who are low on extraversion ($\beta = .61$, $t = 7.23$, $p < .001$). Therefore, Hypothesis 2a was supported. Fig. 2 showed that individuals who are high on extraversion improved their behavioral CQ more than did individuals who are low on extraversion. As can be seen in Fig. 2, the slope was significantly steeper for individuals who are high on extraversion ($\beta = .84$, $t = 12.70$, $p < .001$) compared to those who are low on extraversion ($\beta = .47$, $t = 5.33$, $p < .001$). Therefore, Hypothesis 2d was supported. However, the regression analysis found no other interaction effects, indicating that greater extraversion did not affect changes in cognitive CQ and motivational CQ at Time 2. Therefore, Hypothesis 2b and 2c was not supported.

As can be seen in Fig. 3, it appears that individuals who are high on openness to experience improved their motivational CQ more than did individuals who are low on openness to experience. The slope in Fig. 3, was significantly steeper for individuals who are high on openness to experience ($\beta = .69$, $t = 8.04$, $p < .001$) compared to those who are low on openness to experience ($\beta = .40$, $t = 3.27$, $p < .001$). Therefore, Hypothesis 3c was supported. The regression analysis indicated that greater openness

**Table 1**
Means, standard deviations, and scale reliabilities and inter-correlations.

| Variables | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Age | 32.10 | 5.47 | – | | | | | | | | | | | | | | | | |
| 2. Previous missions in international operations | .80 | 1.03 | .43** | – | | | | | | | | | | | | | | | |
| 3. Service in the armed forces | 9.91 | 5.40 | .90** | .48** | – | | | | | | | | | | | | | | |
| 4. Education | 3.05 | 1.01 | .23** | .19* | .17 | – | | | | | | | | | | | | | |
| **Time 1** | | | | | | | | | | | | | | | | | | | |
| 5. Metacognitive CQ | 4.93 | 1.49 | .14 | .23* | .13 | .10 | (.90) | | | | | | | | | | | | |
| 6. Cognitive CQ | 3.93 | 1.30 | .10 | .10 | .06 | .11 | .24** | (.83) | | | | | | | | | | | |
| 7. Motivational CQ | 5.22 | 1.50 | .24** | .16 | .16 | .04 | .60** | .36** | (.89) | | | | | | | | | | |
| 8. Behavioral CQ | 4.80 | 1.37 | .14 | .20* | .10 | −.01 | .58** | .34** | .69** | (.89) | | | | | | | | | |
| 9. Conscientiousness | 5.38 | 1.70 | .04 | .01 | −.04 | .11 | .06 | −.03 | .13 | .10 | (.83) | | | | | | | | |
| 10. Agreeableness | 5.16 | 1.72 | .04 | −.05 | −.04 | .09 | .20* | −.03 | .19* | .16 | .06 | (.89) | | | | | | | |
| 11. Neuroticism | 3.75 | 1.69 | .04 | .05 | .04 | −.02 | −.13 | .14 | −.14 | −.19* | .04 | .02 | (.86) | | | | | | |
| 12. Extraversion | 5.40 | 1.37 | .05 | .10 | .05 | .05 | .40** | .04 | .30** | .37** | .12 | .34** | −.07 | (.87) | | | | | |
| 13. Openness | 5.17 | 1.47 | .15 | .08 | .11 | .10 | .39** | .15 | .23* | .36** | .03 | .13 | .01 | .19* | (.91) | | | | |
| **Time 2** | | | | | | | | | | | | | | | | | | | |
| 14. Metacognitive CQ | 5.38 | 1.23 | .12 | .10 | .10 | .13 | .83** | .28** | .53** | .54** | .07 | .17 | −.08 | .44** | .40** | (.94) | | | |
| 15. Cognitive CQ | 4.39 | 1.14 | .02 | .01 | .01 | .14 | .15 | .81** | .20* | .23* | .05 | .02 | .11 | .06 | .17 | .19* | (.90) | | |
| 16. Motivational CQ | 5.60 | 1.06 | .24** | .16 | .14 | .03 | .46** | .21* | .66** | .56** | .21* | .15 | −.08 | .31*** | .34** | .43** | .11 | (.91) | |
| 17. Behavioral CQ | 5.50 | 1.05 | .13 | .11 | .07 | −.02 | .39** | .31** | .48** | .78** | .06 | .28** | −.08 | .40** | .43** | .39** | .24** | .41** | (.89) |

CQ = cultural intelligence. Reliability coefficients are in parentheses along the diagonal.
* $p < .05$.
** $p < .01$.

**Table 2**
Means and standard deviations for CQ factors scores over time.

| Individuals | *n* | Time 1 | | | | | | | | Time 2 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Metacognitive CQ | | Cognitive CQ | | Motivational CQ | | Behavioral CQ | | Metacognitive CQ | | Cognitive CQ | | Motivational CQ | | Behavioral CQ | |
| | | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| No Prior International Experience | 60 | 4.75 | 1.52 | 3.82 | 1.39 | 5.13 | 1.66 | 4.64 | 1.39 | 5.37 | 1.21 | 4.40 | 1.25 | 5.50 | 1.22 | 5.43 | 1.13 |
| Prior International Experience | 52 | 5.15 | 1.45 | 4.05 | 1.19 | 5.33 | 1.30 | 4.99 | 1.32 | 5.39 | 1.26 | 4.37 | 1.00 | 5.71 | .85 | 5.58 | .96 |
| Total | 112 | 4.93 | 1.49 | 3.93 | 1.30 | 5.22 | 1.50 | 4.80 | 1.37 | 5.38 | 1.23 | 4.39 | 1.14 | 5.60 | 1.06 | 5.50 | 1.05 |

CQ = cultural intelligence.

**Table 3**
Hierarchical regression results for the moderating effect of personality (extraversion and openness) on international assignment effects.

| Predictor/step | *B* | $R^2$ | $\Delta R^2$ |
|---|---|---|---|
| DV: Metacognitive $CQ_{Time2}$ | | | |
| 1. Prior International Experience | −.09 | .010 | |
| 2. Metacognitive $CQ_{Time1}$ | .79*** | | |
| Extraversion | .08 | | |
| Openness | .10 | .729 | .719 |
| 3. Metacognitive $CQ_{Time1}$ × Extraversion | .13** | | |
| Metacognitive $CQ_{Time1}$ × Openness | .07 | 763 | .035 |
| DV: Cognitive $CQ_{Time2}$ | | | |
| 1. Prior International Experience | −.04 | .00 | |
| 2. Cognitive $CQ_{Time1}$ | .71*** | | |
| Extraversion | .02 | | |
| Openness | .22** | .672 | .672 |
| 3. Cognitive $CQ_{Time1}$ × Extraversion | .03 | | |
| Cognitive $CQ_{Time1}$ × Openness | .10 | .691 | .019 |
| DV: Motivational $CQ_{Time2}$ | | | |
| 1. Prior International Experience | .05 | .027 | |
| 2. Motivational $CQ_{Time1}$ | .60*** | | |
| Extraversion | .10 | | |
| Openness | .26** | .459 | .432 |
| 3. Motivational $CQ_{Time1}$ × Extraversion | .08 | | |
| Motivational $CQ_{Time1}$ × Openness | .13* | .487 | .028 |
| DV: Behavioral $CQ_{Time2}$ | | | |
| 1. Prior International Experience | .04 | .013 | |
| 2. Behavioral $CQ_{Time1}$ | .73*** | | |
| Extraversion | .18** | | |
| Openness | .10 | .627 | .614 |
| 3. Behavioral $CQ_{Time1}$ × Extraversion | .14** | | |
| Behavioral $CQ_{Time1}$ × Openness | .09 | .652 | .025 |

CQ = cultural intelligence; DV = dependent variable.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

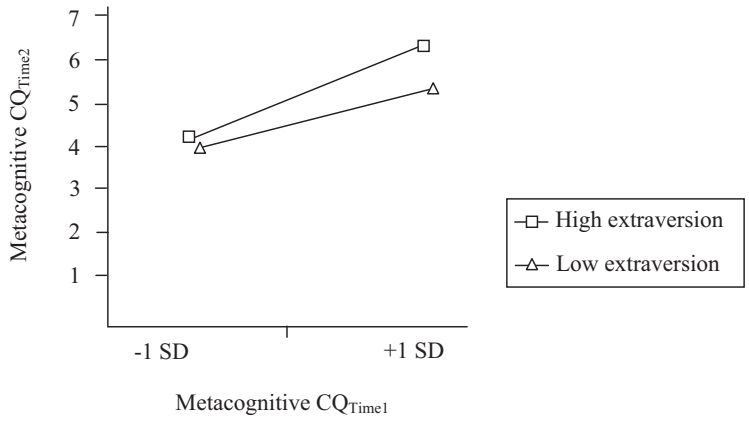


**Fig. 1.** The moderating effect of extraversion on international assignment effects (metacognitive CQ). *Note*. Low score equals one standard deviation below the mean; high score equals one standard deviation above the mean. Only scores plus or minus one standard deviation from the mean of metacognitive CQ scores at Time 1 are plotted.

to experience did not affect changes in metacognitive CQ, cognitive CQ, and behavioral CQ at Time 2. These results did not support Hypothesis 3a, Hypothesis 3b, and Hypothesis 3d.

For the sake of completeness, we tested the effects of other personality traits (conscientiousness, agreeableness and neuroticism) on the relation between international assignment and CQ. No interaction effects were found.

## 5. Discussion

The findings of the present study indicated the six-month international assignment did have a statistically significant effect on the development all four facets of CQ over time. Moreover, the results showed that extraversion has a moderating role in the relationship between international assignment and metacognitive CQ and behavioral CQ, while openness to experience personality trait has a moderating role in the relationship between international assignment and motivational CQ.

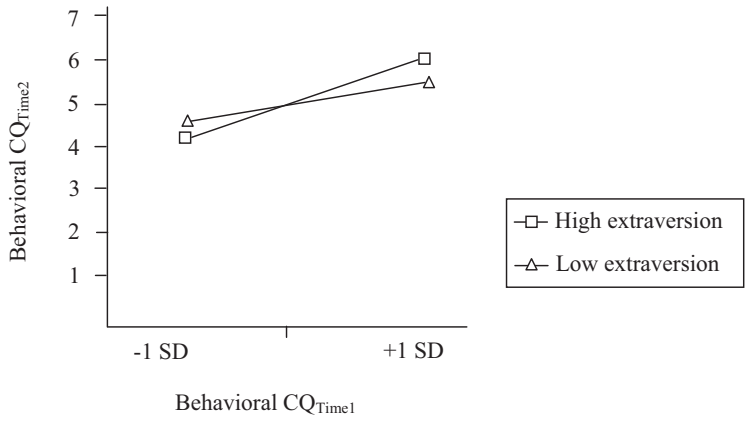


**Fig. 2.** The moderating effect of extraversion on international assignment effects (behavioral CQ). *Note*. Low score equals one standard deviation below the mean; high score equals one standard deviation above the mean. Only scores plus or minus one standard deviation from the mean of behavioral CQ scores at Time 1 are plotted.

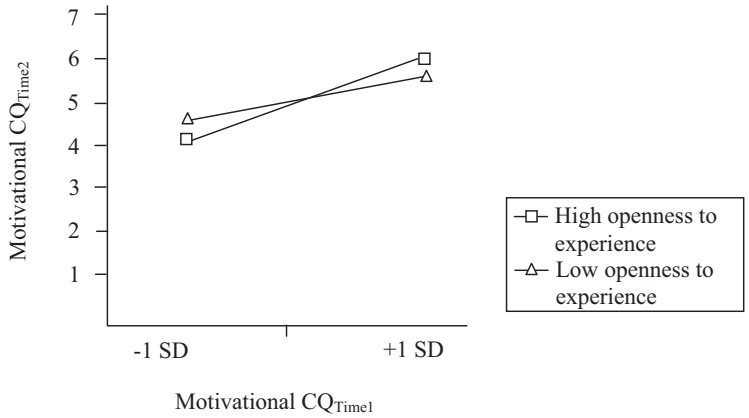


**Fig. 3.** The moderating effect of openness to experience on international assignment effects (motivational CQ). *Note*. Low score equals one standard deviation below the mean; high score equals one standard deviation above the mean. Only scores plus or minus one standard deviation from the mean of motivational CQ scores at Time 1 are plotted.

One of the primary contributions of the present study is the empirical examination of the effect of international assignments on the development of CQ over time. Previous studies showed the positive link between international experience and CQ (e.g., Shannon & Begley, 2008; Tarique & Takeuchi, 2008; Tay et al., 2008). This study extends the findings from previous studies and provides empirical evidence that international assignment have a significant effect on the development all four facets of CQ in a multicultural setting. Specifically, after a period of six months all four facets CQ scores of the participants were significantly improved. Working and/or living in other cultures provides knowledge and social context that can affect individuals' CQ. Another contribution of the present study is the finding that personality traits (i.e., extraversion and openness to experience) have a moderating role in the relationship between international assignment and CQ. Our study provides empirical evidence that extraversion moderated the relationship between international assignment and metacognitive and behavioral CQ, such that individuals who were high on extraversion changed their metacognitive and behavioral CQ than did individual who are low on extraversion. This makes sense because those who are self-confident, sociable and assertive seek opportunities to interact with others who have different cultural backgrounds during cross-cultural interactions. Moreover, extraverts also show a higher tendency to enjoy interpersonal interactions and therefore may display more flexible behavior. Thus, our study show that CQ improvement (i.e., metacognitive and behavioral CQ) benefits resulting from international assignment experiences may depend on the extent to which individuals who are high on extraversion. Our study also provides empirical evidence that openness to experience moderated the relationship between international assignment and motivational CQ. Openness to experience is characterized by curiosity, having a wide range of interests, and broad-mindedness. Looking at the findings of the present study more deeply, it can be said that individuals who are high on openness to experience changed their motivational CQ than did individual who are low on openness to experience.

Contrary to our expectations, moderating role of personality traits (i.e., extraversion and openness to experience) in the relationship between international assignment and some facets of CQ was not confirmed. Van Dyne et al. (2012) suggested that some individuals may be high on all factors of CQ, while some individuals may be high on any factors of CQ. For example, some individuals may know a lot about the norms, practices, and conventions in other cultures. Some individuals may be adept at exhibiting appropriate behaviors in new cultural settings. This indicates that individuals have different CQ profile. Moreover, previous research have indicated that the four factors of CQ have unique contributions to effectiveness in

culturally diverse settings (e.g., Ang et al., 2007; Chen, Kirkman, Kim, Farh, & Tangirala, 2010; Imai & Gelfand, 2010; Templer, Tay, & Chandrasekar, 2006). Perhaps, one explanation for why personality traits extraversion and openness to experience did not have effect on the relationship between international assignment and some factors of CQ is that individual may have different CQ profiles (Van Dyne et al., 2012). Specifically, future research efforts investigating different CQ profiles with relation to personality traits will be an important contribution.

### 5.1. Implications for research and practice

The finding that the international assignment in a multicultural environment is associated with higher levels of CQ contributes to the literature in several ways. First, this finding provides support for the conceptual models that suggest international assignment is effective in developing cross-cultural competence as Johnson, Lenartowicz, and Apud (2006) argued. Second, we extend prior research findings on international experience–CQ relationship by including multinational military setting and using longitudinal design. Third, the current study is the first to examine personality as a moderating variable in the relationship between international assignment and CQ in a multi-cultural environment. Thus, this study also responds to calls for longitudinal research on whether personality variables affect the relationship between international experience and CQ (Ng et al., 2012). We encourage researchers to examine the relationship between other individual differences (e.g., self-efficacy, core self-evaluation) and CQ factors.

The present study also has practical implications for international and/or multinational assignments especially for selecting, training, and developing a more culturally intelligent workforce. For example, since our results uncovered that international assignments have an impact on development of CQ over time, individuals who have prior multi-cultural assignment experience are more likely to have higher CQ and might function effectively in a novel environment. Thus, it seems reasonable that multinational organizations should place more emphasis on prior international experience and consider recruiting individuals with international work experience in selecting candidates for multinational assignments and expatriation. Furthermore, since our results provide support for moderating role of personality traits (i.e., extraversion and openness to experience) in relationship between international assignment and certain facets of CQ, organizations should take into consideration personality profiles when selecting individuals for multinational assignments and expatriation.

### 5.2. Limitations of the research

Several limitations should be acknowledged for future studies. First, although we collected self-rating of CQ at two points in a six-month period using longitudinal design, all of our data were provided by the same individuals. The sole reliance on this format may increase the problem of common method variance and lead to inflated correlations (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Given our findings of significant interaction effects, common method bias for the present study is less likely to be a matter of concern. Evans (1985) conducted an extensive Monte Carlo study regarding whether method variance might generate artifactual interactions and concluded that "artifactual interactions cannot be created; true interactions can be attenuated" (p. 305). This finding suggests that the existence of interaction effect of personality traits on international assignment effects tends to rule out the possibility of the results being an artifact of common method bias. Nevertheless, it would be worthwhile for future studies to consider multiple sources of data.

Second, our sample consisted of military personnel and was predominantly male. This may limit the generalizability of our findings. However, there has been an increasing number of multinational efforts, including peacekeeping, humanitarian, and as well as actual combat situations (e.g., Palin, 1995). As such, military members are being relied upon to interact with members from other nations or cultures. CQ focuses on capabilities to manage effectively in situations characterized by cultural diversity (Ang & Van Dyne, 2008). Our findings which indicated the effects of international military assignment and personality on the development of CQ suggest that individuals who are exposed to cross-cultural environment may have opportunity to develop his or her CQ. Nevertheless, future studies should validate the findings of the present study in other job types as well as across nationalities. Future studies should also include female participants, as well as male, for generalizability. Finally, it would be worthwhile for future studies to conduct a qualitative study using interview or observation that may provide broader understanding of CQ.

## 6. Conclusion

Our study adds to the growing literature on CQ by providing empirical evidence that international assignment has a significant effect on the development all four facets of CQ in a multicultural setting. We also expanded CQ and personality literature by examining the effect of personality variables on the relationship between international assignment experience and CQ over time. Specifically, the results of our study demonstrated that extraversion moderated the relationship between international assignment and metacognitive and behavioral CQ, while openness to experience had a moderating role only in the relationship between international assignment and motivational CQ. Given the promising results, we hope that future research will provide further understanding of the effect of personality on the relationship between international experience and CQ.

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