

Measuring Cultural Intelligence in the Turkish Context

Faruk Şahin*, Sait Gürbüz, Onur Köksal*** and Ümit Ercan****

*Department of Business Administration, The Faculty of Economics and Administrative Sciences, Niğde University, 51240 Niğde, Turkey. faruksahin@nigde.edu.tr; fsahin11@hotmail.com

**Defense Sciences Institute, Turkish Military Academy, Ankara, Turkey

***Niğde University, Niğde, Turkey

The present article reports the results of two studies designed to evaluate the psychometric properties of the cultural intelligence (CI) scale in the Turkish context. The proposed four-factor (cognitive, metacognitive, motivational, and behavioral) structure of CI was confirmed by confirmatory factor analysis. The results supported the discriminant validity of the four-factor model of the CI scale in relation to the Big Five personality factors and the emotional intelligence factors. Furthermore, CI explained additional variance in intercultural task performance over and above that explained by demographic characteristics and emotional intelligence. With regard to internal consistency and test-retest reliability, the CI scale showed acceptable results and was in concordance with the prior studies. Taken together, these findings suggest that the Turkish version of CI scale is a reliable and valid measure that can be used to measure individual's intercultural capabilities.

1. Introduction

In today's global and diverse world, intercultural capabilities play a crucial role in performing effectively in situations characterized by cultural diversity. There has been a growing body of literature that examines the intercultural capabilities over the last decade and the construct of cultural intelligence (CI) has captured intercultural capabilities (Ang & Van Dyne, 2008). Defined as an individual's capability to function and manage effectively in culturally diverse situations (Earley & Ang, 2003), CI explains why some individuals are more capable of coping with, adapting to, and performing more effectively in culturally diverse environments than others (Ang et al., 2007; Ng, Van Dyne, & Ang, 2012).

CI is conceptualized as a multidimensional construct with mental (metacognitive and cognitive), motivational, and behavioral components (Earley & Ang, 2003). Metacognitive CI refers to the capability for consciousness and awareness during intercultural interactions. It reflects the mental capabilities to acquire and understand cultural knowledge, including knowledge of and

control over individual thought processes relating to culture. Whereas metacognitive CI focuses on higher-order cognitive processes, cognitive CI is general knowledge about the structures of a culture. It refers to knowledge of norms, practices, and conventions in different cultures that has been acquired from educational and personal experiences. Motivational CI reflects the capability to direct attention and energy toward learning about appropriate responses and functioning in intercultural situations. Finally, behavioral CI refers to the capability to exhibit situationally appropriate verbal and nonverbal actions when interacting with people from different cultural backgrounds (Ang et al., 2007; Ang & Van Dyne, 2008; Ng & Earley, 2006; Ng et al., 2012).

Since the introduction of CI into the international business literature by Earley and Ang (2003), it has attracted considerable attention worldwide and across diverse disciplines ranging from international management to cross-cultural psychology (Ang & Van Dyne, 2008). An increasing amount of research has demonstrated the positive associations between CI and beneficial outcomes such as expatriate performance in international

assignments, cultural adaptation and task performance, adaptive performance, interpersonal trust, successful intercultural negotiations, and cross-border leadership effectiveness (Ng et al., 2012).

2. The present study

To enable the study of individual differences in CI, Ang et al. (2007) developed the cultural intelligence scale, which consists of four dimensions to measure metacognitive, cognitive, motivational, and behavioral facets of CI. The CI scale was found to be valid and reliable measure across samples, time, and countries (Van Dyne, Ang, & Koh, 2008). However, to our knowledge, there has been no study employing the CI scale in the Turkish context. Therefore, in this study, we aimed to examine the psychometric properties of the CI scale in the Turkish context and validate the Turkish version of the CI scale by testing whether it would replicate prior findings with regard to factorial structure and associations with other constructs. Hence, this study contributes to the generalizability of the CI construct across countries.

Two specific aims were addressed in order to evaluate the psychometric properties of the Turkish version of the CI scale. The first aim was to test the factorial structure of the Turkish version of the CI scale. We expected to confirm the four-factor model identified by the original study (Ang et al., 2007) and then recent studies in several contexts (e.g., Moon, 2010; Ward, Fischer, Lam, & Hall, 2009). The second aim was to examine the relationships between the Turkish version of the CI scale and conceptually related constructs to provide information on the divergent and incremental validity of the instrument. We formulated three predictions according to theoretical assumptions and prior findings (Ang & Van Dyne, 2008; Ang, Van Dyne, & Koh, 2006; Moon, 2010; Ward et al., 2009).

The first prediction concerned the relation with personality traits which are distinguishing qualities or characteristics of an individual and are exhibited in a wide range of social and personal contexts (McCrae & Costa, 2003). Personality traits, which are relatively stable over time, influence individuals' behaviors that should determine CI (Ang et al., 2006). Earley and Ang (2003) formulated CI as a state-like individual difference which describes intercultural capabilities that can be shaped by trait-like individual difference such as personality characteristics. To date, Ang et al. (2006) showed how CI and the Big Five traits of personality are distinct, but related constructs. Of the Big Five personality traits, openness to experience – the tendency to be imaginative, independent, adventurous, and interested in variety of experience (McCrae & Costa, 2003) – was found to be related to all factors of CI. Moody (2007) also

found that openness to experience is the most significant predictor of CI. Given that both CI and openness to experience focus on novel situations, these findings provided construct validity of CI (Ng et al., 2012). Moreover, significant relationships were found between specific personality traits and specific factors of CI (Ang et al., 2006; Moody, 2007). Therefore, we aimed to examine the relationship between CI factors and the Big Five personality traits to validate CI construct in the Turkish context.

The second prediction concerned the relation with emotional intelligence (EI), which is an aspect of multiple intelligence theory (Elenkov & Pimentel, 2008). EI refers to the ability to perceive, understand, and manage emotion in oneself and others. Specifically, Mayer and Salovey (1997) described EI as the ability to perceive emotion, integrate emotion to facilitate thought, understand emotions, and to regulate emotions to promote personal growth. Although EI is still a developing construct, numerous studies have shown positive relationships between EI and individual, group, and organizational performance (e.g., Bar-On & Parker, 2000; Goleman, 1995; Mayer & Salovey, 1995; Van Rooy & Viswesvaran, 2004). Earley and Ang (2003) have argued that just as EI complements mental intelligence, CI is another complementary form of intelligence that explains adapting effectively to culturally diverse situations. Some scholars (e.g., Crowne, 2009; Thomas, 2006) noted that several overlapping characteristics exist between CI and EI; however, CI is separate and distinct from EI in that what is meaningful in one culture may not apply in another. To date, a few studies (e.g., Kim, Kirkman, & Chen, 2008; Moon, 2010) have demonstrated how EI and CI are distinct, but related construct. However, Ward et al. (2009) found strong correlations between CI factors and EI and raised the question as to whether the constructs are separate. Hence, testing the convergent or divergent validity of CI and EI scores is one objective of the current study.

The third prediction concerned the relation with task performance behaviors, which include job-specific behaviors that are associated with the use of technical skills, specific knowledge, abilities, and motivation directed at role-prescribed behavior (Campbell, 1999). Ang et al. (2007) found that only metacognitive and behavioral CI predict task performance. However, in cross-cultural situations, individuals with high CI know when and how to apply their cultural knowledge, direct their attention and energy toward learning about appropriate responses and functioning, and exhibit situationally appropriate verbal and nonverbal behaviors (Ang & Van Dyne, 2008; Earley & Ang, 2003). Hence, all the components of CI are expected to enhance cognitive understanding, motivation, and behavioral enactment of role expectations.

3. Materials and methods

3.1. Participants and procedure

The Turkish version of the CI scale was administered to two samples. We recruited the first sample from two public universities in Turkey. CI has a direct relevance to students because they increasingly cross culture for studying, internships, and travelling abroad. We collected data at two points during one semester. All students were volunteers and received no credit for their participation in the study. At the beginning of the semester, we distributed 600 surveys to undergraduate students in the business administration program. The participants were asked to rate themselves on the CI scale and to indicate average length of international experience. A total of 450 questionnaires were usable, resulting in a response rate of 75%. Of the 450 undergraduate students, 60.4% were female and 39.6% were male. The mean age of the participants was 21.38 years ($SD = 3.51$). Participants indicated a mean length of 5.77 months ($SD = 42.79$) of international experience. A total of 101 participants (57.4% female and 42.6% male) completed a test–retest for the CI scale after a period of 1 month. At the end of the semester (4 months later), 181 participants (61.9% female and 38.1% male) completed the Big Five Inventory. The Grade Point Averages (GPAs) were collected at the end of the semester. We tested whether nonrespondents at the end of the semester were significantly different on any characteristics at the beginning of the semester. No significant difference was found on any sample characteristics from the participants at the initial and follow-up assessment.

We recruited the second sample from the companies in international hospitality industry in Turkey. Studying CI of professionals from international hospitality industry is particularly relevant as they frequently experience cross-cultural interactions. Participation in the study was voluntary. We distributed 400 surveys to employees of the companies in international hospitality industry; a total of 264 surveys were returned for a response rate of 66%. The participants were asked to rate themselves on CI, EI, and in-role performance scales. In addition to completing these scales, each participant was asked to recruit a colleague to evaluate his or her performance. Using peers for the assessment of in-role performance is appropriate because they had experience in the international hospitality industry, worked near each other, and were able to observe peers' in-role performance. Twenty-three surveys were deemed unusable because of incomplete answers, leaving 241 usable surveys. Of the 241 participants, 59.8% were male and 40.2% were female. The average age was 33.72 ($SD = 5.97$) and 71.8% of the participants had prior international work and/or nonwork experiences with an average of 5.62 months ($SD = 9.92$). Participants were well-educated,

with 51.9% holding a bachelor degree, 16.2% a master's degree, 1.7% a doctoral degree, and the rest having completed associate or high school. The average tenure with the organization was 6.59 years.

3.2. Measures

3.2.1. Cultural intelligence

CI was assessed with the 20-item four-factor scale developed by Ang et al. (2007). This scale includes 4 items for metacognitive CI, 6 items for cognitive CI, 5 items for motivational CI, and 5 items for behavioral CI (e.g., 'I change my verbal behavior [accent, tone] when a cross-cultural interaction requires it'). Participants rated items on a 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores on factors indicated a greater propensity to employ an intercultural ability.

3.2.2. Personality

We measured the Big Five personality traits using the 44-item Big Five Inventory – BFI (Benet-Martinez & John, 1998). The scale included 8 items for extraversion (e.g., 'I see myself as someone who is talkative'), 9 items for agreeableness, 9 items for conscientiousness, 8 items for neuroticism, and 10 items for openness. Participants indicated the applicability of characteristics and behaviors to themselves on a 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The reliabilities of these scales were .87 for extraversion, .90 for agreeableness, .90 for conscientiousness, .96 neuroticism, and .89 for openness.

3.2.3. Emotional intelligence

We assessed EI with Schutte et al.'s (1998) 33-item four-factor scale. This scale includes 12 items for emotion regulation, 8 items for emotional facilitation of thoughts, 6 items for perceive/appraise/express emotions, and 7 items for emotional understanding/knowledge (e.g., 'It is difficult for me to understand why people feel the way they do'). Participants rated items on a 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores reflect greater EI. The reliabilities of subscales ranged from .71 to .92.

3.2.4. GPA

We collected the GPA scores by accessing each student's transcript. This measure was based upon the transcript reports of the students' cumulative GPA, which contained every class that was completed by the participant. A scale of 0–4 was used to represent the students' academic achievement.

3.2.5. Intercultural task performance

Five in-role behavior items adapted from Williams and Anderson (1991) were used to measure intercultural

task performance. An example of the modified items include 'Overall, I effectively fulfill my roles and responsibilities concerning the cross-cultural contexts'. These items appraise the tasks that individuals are expected to perform as a normal function of his or her job. Participants rated items on a 7-point Likert-type scale, ranging from 1 (*not at all*) to 7 (*all the time*). We measured peer-rated intercultural task performance by asking peers to rate the reworded items (e.g., 'Overall, this person effectively fulfills his/her roles and responsibilities concerning the cross-cultural contexts'). Respondents assessed the performance of each of their colleagues by using a rating from 1 (*not at all*) to 7 (*all the time*). The reliabilities of the self- and peer-rated scale were .85 and .87, respectively.

4. Analyses and results

Data analyses were conducted using SPSS version 13.0 and LISREL version 8.54 software (Jöreskog & Sörbom, 2003). We first calculated means and standard deviations (*SD*) of the four factors of CI. The independent samples *t*-tests were used to determine if there were differences in samples for each factor of the CI scale. We then utilized a confirmatory factor analysis (CFA) to confirm the four-factor structure of CI. We evaluated the internal consistency of the CI scale by calculating the Cronbach's alpha coefficients for the total CI scale and for each of the factors and test-retest correlations. Moreover, we studied the relationships among CI, the Big Five personality traits, GPAs, EI, and intercultural task performance.

4.1. Factorial validity

The independent samples *t*-tests were conducted for all factors of the CI scale. Participants in sample 2 scored higher than did the participants in sample 1 on three factors of the CI scale. A significant difference was found in the scores on cognitive CI for sample 1 ($M=4.08$, $SD=1.08$) and sample 2 ($M=4.86$, $SD=0.87$), $t(689)=-9.615$, $p<.001$, $d=.77$. There was a significant difference in the scores on motivational CI for sample 1 ($M=5.39$, $SD=1.07$) and sample 2 ($M=5.93$, $SD=0.68$), $t(689)=-7.151$, $p<.001$, $d=.57$. The participants in sample 2 ($M=5.59$, $SD=0.73$) scored significantly higher on behavioral CI than did the participants in sample 1 ($M=5.13$, $SD=1.06$), $t(689)=-6.038$, $p<.001$, $d=.48$. No significant difference was found for the metacognitive CI, $t(689)=.574$, *ns*.

A CFA was performed on sample 1 to test 20-item, four-factor structure of the Turkish version of the CI scale. Data were analyzed using the maximum likelihood robust estimation method. Because a fit index cannot

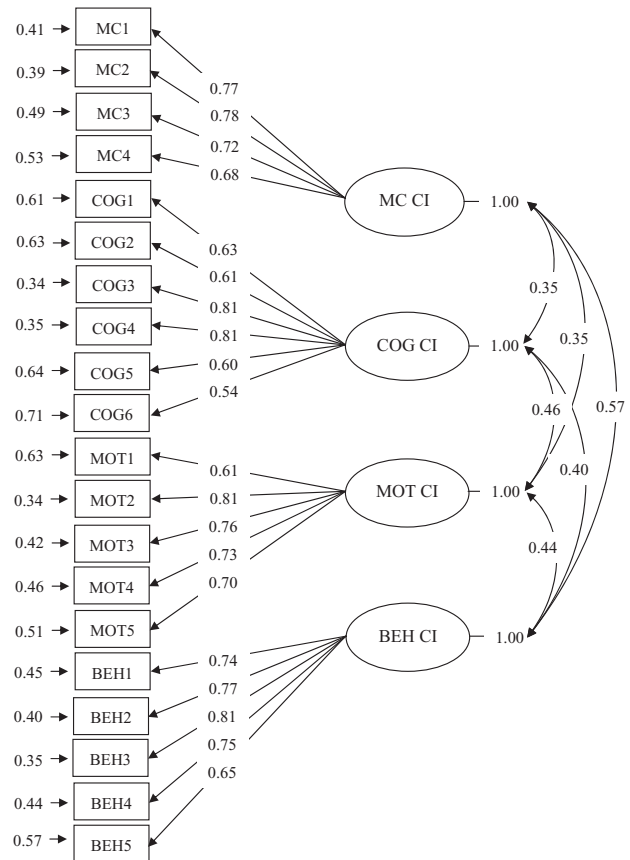


Figure 1. Confirmatory factor analysis of 20-item cultural intelligence (CI) model (sample 1, $n=450$).

assess every aspect of goodness-of-fit index (GFI), multiple measures of GFI was used in CFA to evaluate and determine the best model fit for the data (Hoyle & Panter, 1995). Several alternative models suggested by Ang et al. (2007) were also tested. We first examined the four-factor model of the CI scale (see Fig. 1). Results indicate that the model was a good fit to the data for the Turkish university sample: $\chi^2(164)=553.33$, $p<.01$; GFI=.89; (Bentler's) comparative fit index (CFI)=.95; non-normed fit index (NNFI)=.94; root mean square error of approximation (RMSEA)=0.073; 90% confidence interval (CI) [0.066–0.079]; and standardized root mean square residual (SRMR)=0.059. All of the standardized factor loadings were statistically significant. Although some of the scores (e.g., RMSEA=0.073; GFI=.88) were slightly beyond optimal size, the other indicators were in an acceptable range. We compared the relative fit of the four-factor model with alternative models. First, a three-factor model in which the metacognitive and cognitive factors were combined yielded a relatively poor fit: $\chi^2(167)=1484.69$, $p<.01$; GFI=.75; CFI=.88; NNFI=.87; RMSEA=0.13; and SRMR=0.10. Second, a two-factor model in which the metacognitive and cognitive factors (cognitive) and the

motivational and behavioral factors were combined (behavioral/motivational) resulted in a relatively poor fit: χ^2 (169) = 2579.01, $p < .01$; GFI = .65; CFI = .81; NNFI = .79; RMSEA = 0.18; and SRMR = 0.12. Third, a two-factor model in which metacognitive factor was contrasted with the other three factors combined also resulted in a relatively poor fit: χ^2 (169) = 2383.23, $p < .01$; GFI = .65; CFI = .82; NNFI = .80; RMSEA = 0.17; and SRMR = 0.11. Finally, one-factor model with all items loaded on a single factor provided the worst fit: χ^2 (170) = 2921.31, $p < .01$; GFI = .61; CFI = .78; NNFI = .75; RMSEA = 0.19; and SRMR = 0.13. In summary, the four-factor model provided the best fit compared to the other four models and supported the four-dimensional solution of the CI scale.

4.2. Reliability indices

The internal consistencies (Cronbach's alpha) were computed for the four factors and the total CI scale in samples 1 and 02. As shown in Tables 1 and 3, coefficient alphas for each of the four factors of CI ranged from .78 to .83 in sample 1 and from .78 to .89 in sample 2, exceeding cut-off point of .70, as suggested by Nunnally (1978). We used Pearson's correlation coefficients to examine test-retest reliability. The 1 month test-retest reliability for the total CI scale was .74, and the 1 month test-retest reliability for the four factors of CI ranged from .63 to .72.

4.3. Relations with other constructs

To explore further the psychometric properties of the Turkish version of the CI scale, the correlations among the four factors of CI and other theoretically related constructs were analyzed. Table 1 presents the correlations between CI and its factors with the Big Five personality factors and GPA scores. The correlations among CI factors are statistically significant, ranging from .25 to .42. Of the four factors of CI, metacognitive CI ($r = .21$, $p < .01$) and cognitive CI ($r = .15$, $p < .05$) positively correlated with GPA scores. Cognitive CI was the only CI factor that was not related to the Big Five personality factors, except openness to experience ($r = .15$, $p < .05$). The direction of the correlations among metacognitive, motivational, behavioral factors of CI, and the Big Five personality factors coincides with that expected from the previous studies. The correlational relationships between the Big Five personality factors and each of the dependent CI factors showed a preliminary support to the divergent validity of the CI scale.

A CFA was performed to assess the distinctiveness of the four factors of CI compared to the Big Five

Table 1. Means, standard deviations, and scale reliabilities and intercorrelations (sample 1)

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	Test-Retest ^c
Time 1^a														
1. Metacognitive CI	5.51	0.97	(.78)											.72**
2. Cognitive CI	4.08	1.08	.29**	(.81)										.69**
3. Motivational CI	5.39	1.07	.25**	.39**	(.82)									.65**
4. Behavioral CI	5.13	1.06	.42**	.36**	.35**	(.83)								.63**
5. Total CI	4.95	0.75	.61**	.77**	.71**	.74**	(.87)							.74**
Time 2^b														
6. Conscientiousness	5.56	1.61	.23**	-.01	.29**	.23**	.25**	(.90)						
7. Agreeableness	5.26	1.74	.26**	.08	.24**	.28**	.17*	.17*	(.90)					
8. Neuroticism	3.63	1.73	-.24**	.09	-.23**	-.22**	-.20**	-.04	.00	(.96)				
9. Extraversion	5.02	1.55	.28**	.11	.33**	.37**	.35**	.26**	.10	-.15*	(.87)			
10. Openness	5.24	1.43	.45**	.15*	.38**	.47**	.47**	.22**	.17*	-.03	.18*	(.89)		
11. GPAs	2.69	0.57	.21**	.15*	.13	.11	.19**	.16*	.18*	.01	.01	.22**	-	

Notes: * $p < .05$; ** $p < .01$. ^a $n = 450$ at time 1; ^b $n = 181$ at time 2; ^c $n = 101$; CI = cultural intelligence; GPA = grade point average.

personality factors. The fit indices for all tested models as well as the chi-square difference tests between the alternative model and the nine-factor model are presented in Table 2. The results demonstrated the best fit for the nine-factor model compared to the other alternate nested models: χ^2 (1916) = 6393.31, $p < .01$; GFI = .74; CFI = .94; NNFI = .94; RMSEA = 0.92; and SRMR = 0.076. In order to examine the relative fit of the nine-factor model, we compared this nine-factor model with alternate nested models. Nested model comparisons demonstrated that the nine-factor model showed better fit than alternate models, which supports the discriminant validity of the four CI factors compared to the Big Five personality factors.

Table 3 indicates the relationships between the four factors of CI and other constructs, namely EI and in-role performance. The correlations between CI factors and EI factors ranged from nonsignificant to significant and low to moderate in magnitude. As would be expected, the total CI was significantly related to the total EI ($r = .50$, $p < .01$). In addition, the total CI scores were significantly related to self-rated in-role performance ($r = .36$, $p < .01$) and peer-rated in-role performance ($r = .34$, $p < .01$) scores. Similarly, the total EI scores were significantly related to self-rated in-role performance ($r = .22$, $p < .01$) and peer-rated in-role performance ($r = .24$, $p < .01$) scores. In summary, these results gave a preliminary support to the divergent validity of the CI scale.

We assessed the distinctiveness of the four factors of CI compared to the four factors of EI by using CFA. Table 4 presents the fit for all tested models as well as the chi-square difference tests between the alternative model and the eight-factor model. The results indicated that the eight-factor model demonstrated the best fit compared to the other alternate nested models: χ^2 (1297) = 2629.52, $p < .01$; GFI = .71; CFI = .91; NNFI = .90; RMSEA = 0.065; and SRMR = 0.075. Furthermore, χ^2 difference test indicated that the eight-factor model demonstrated better fit than alternate models. Overall, the results of the present study supported the distinctiveness of the four factors of CI and EI clusters.

The results of regression analyses are presented in Table 5. We entered age, gender, and cross-culture experience on the first step to control for their influences on the performance outcome. This is followed by EI factors entered on step 2, and, finally, the CI factors were entered on the final step to examine the incremental validity. Hierarchical regression results showed that age, gender, cross-culture experience, EI, and CI explained 17% of the variance in self-rated in-role performance and 19% in peer-rated in-role performance. The addition of EI factors in step 2 increased the explained variance significantly for self-rated in-role performance ($\Delta F = 3.96$, $p < 0.01$) and peer-rated in-role performance ($\Delta F = 4.73$, $p < 0.001$). The results in step 3

Table 2. Comparing the fit of alternative nested models for the CI and the big five personality (sample 1)

Model	χ^2	df	RMSEA	SRMR	GFI	NNFI	CFI	Model comparison test		
								Comparison	$\Delta\chi^2$	Δdf
A. Nine-factor model (four CI + Big Five)	6,393.31	1,916	0.92 (0.90–0.95)	0.076	0.74	0.94	0.94	–	–	–
B. Six-factor model (one overall CI factor + Big Five)	7,230.06	1,937	0.12 (0.12–0.13)	0.085	0.44	0.92	0.92	B vs. A	836.75***	21
C. Five-factor model (four CI + one overall personality factor)	23,162.78	1,942	0.25 (0.24–0.25)	0.23	0.20	0.70	0.71	C vs. A	16,769.47***	26
D. Four-factor model (metacognitive CI and Big Five combined + cognitive CI + motivational CI + behavioral CI)	22,900.99	1,946	0.24 (0.24–0.25)	0.22	0.20	0.70	0.71	D vs. A	16,507.68***	30
E. Four-factor model (metacognitive CI + cognitive CI and Big Five combined + motivational CI + behavioral CI)	20,828.32	1,946	0.23 (0.23–0.24)	0.23	0.22	0.71	0.72	E vs. A	14,435.01***	30
F. Four-factor model (metacognitive CI + cognitive CI and Big Five combined + motivational CI + behavioral CI)	21,730.64	1,946	0.24 (0.23–0.24)	0.23	0.21	0.70	0.71	F vs. A	15,337.33***	30
G. Four-factor model (metacognitive CI + cognitive CI + motivational CI + behavioral CI and Big Five combined)	23,133.65	1,946	0.25 (0.24–0.25)	0.22	0.20	0.70	0.71	G vs. A	16,740.44***	30

Notes: *** $p < .001$; ** $p < .01$; * $p < .05$; CI = cultural intelligence; RMSEA = root mean square error of approximation with 90% confidence interval; SRMR = standardized root mean square of residuals; GFI = goodness-of-fit index; NNFI = non-normed fit index; CFI = comparative fit index.

Table 3. Means, standard deviations, and scale reliabilities and intercorrelations (sample 2)

Scales	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Metacognitive CI	5.47	0.83	(.89)														
2. Cognitive CI	4.86	0.87	.37**	(.88)													
3. Motivational CI	5.93	0.68	.60**	.36**	(.78)												
4. Behavioral CI	5.59	0.73	.45**	.35**	.43**	(.82)											
5. Total CI	5.43	0.59	.76**	.75**	.71**	.71**	(.90)										
6. EI: Regulation	5.43	0.69	.26**	.24**	.28**	.17**	.32**	(.92)									
7. EI: Utilization	5.14	0.85	.27**	.13*	.25**	.23**	.28**	.06	(.71)								
8. EI: Appraisals	5.36	0.79	.11	.09	.15*	.20**	.18**	.00	.02	(.77)							
9. EI: Knowledge	5.36	0.75	.27**	.14*	.35**	.33**	.34**	.05	.08	.19**	(.81)						
10. Total EI	5.53	0.42	.41**	.27**	.47**	.43**	.50**	.46**	.57**	.56**	.59**	(.78)					
11. Self rated in-role performance	5.38	0.88	.32**	.22**	.25**	.32**	.36**	.20**	.08	.11	.11	.22**	(.85)				
12. Peer rated in-role performance	5.35	0.90	.37**	.23**	.28**	.32**	.39**	.22**	.09	.12	.12	.24**	.96**	(.87)			
13. Age	33.72	5.97	.12	-.02	.18**	.04	.09	.04	.01	-.02	.06	.04	.11	.11	-.05		
14. Gender	0.40	0.49	.04	.08	.08	.04	.08	-.10	.07	-.02	.13*	.04	.08	.05	.00	-.09	
15. Cross-cultural experience	5.62	9.92	.14*	.04	.19**	.18**	.17**	.03	.02	.04	.04	.06	.09	.08	.36**	.09	-.09

Notes: * $p < .05$; ** $p < .01$; $n = 241$; CI = cultural intelligence; EI = emotional intelligence.

Table 4. Comparing the fit of alternative nested models for the CI and EI factors (sample 2)

Model	χ^2	df	RMSEA	SRMR	GFI	NNFI	CFI	Model comparison test	$\Delta\chi^2$	Δdf
A. Eight-factor model (four CI + four EI)	2,629.52	1,297	0.065 (0.062–0.069)	0.075	0.71	0.90	0.91		–	–
B. Five-factor model (one overall CI factor + four EI)	3,977.00	1,315	0.092 (0.089–0.095)	0.088	0.62	0.85	0.85	B vs. A	1,347.48**	18
C. Five-factor model (four CI + one overall EI factor)	4,318.34	1,315	0.098 (0.094–0.10)	0.11	0.60	0.81	0.81	C vs. A	1,688.82**	18
D. Four-factor model (metacognitive CI and four EI combined + cognitive CI + motivational CI + behavioral CI)	5,463.33	1,319	0.11 (0.11–0.12)	0.13	0.54	0.76	0.77	D vs. A	2,833.81**	22
E. Four-factor model (metacognitive CI + cognitive CI and four EI combined + motivational CI + behavioral CI)	5,557.94	1,319	0.12 (0.11–0.12)	0.13	0.53	0.76	0.77	E vs. A	2,928.42**	22
F. Four-factor model (metacognitive CI + cognitive CI + motivational CI and four EI combined + behavioral CI)	5,224.21	1,319	0.11 (0.11–0.11)	0.13	0.55	0.78	0.79	F vs. A	2,594.69**	22
G. Four-factor model (metacognitive CI + cognitive CI + motivational CI + behavioral CI and four EI combined)	5,426.36	1,319	0.11 (0.11–0.12)	0.13	0.54	0.77	0.78	G vs. A	2,796.84**	22

Notes: ** $p < .01$; *** $p < .001$; $n = 241$; CI = cultural intelligence; EI = emotional intelligence; RMSEA = root mean square error of approximation with 90% confidence interval; SRMR = standardized root mean square of residuals; GFI = goodness-of-fit index; NNFI = non-normed fit index; CFI = comparative fit index.

Table 5. Hierarchical regression analyses (sample 2)

Predictors	Self rated in-role performance			Peer rated in-role performance		
	Step			Step		
	1	2	3	1	2	3
Age	.09	.09	.08	.09	.09	.08
Gender	.08	.08	.08	.05	.06	.05
Cross-cultural experience	.05	.03	-.01	.04	.03	-.02
El: Regulation		.20**	.12*		.21**	.12*
El: Utilization		.05	-.03		.06	-.03
El: Appraisals		.01	.05		.10†	.06
El: Knowledge		.06	-.03		.07	-.03
Metacognitive CI			.18**			.24**
Cognitive CI			.05			.04
Motivational CI			-.01			.00
Behavioral CI			.21**			.18**
R ²	.02	.08	.17	.01	.09	.19
ΔR ²		.06	.09		.08	.10

Notes: * $p < .05$; ** $p < .01$; † $p < .10$; $n = 241$; CI = cultural intelligence; El = emotional intelligence.

demonstrated the incremental validity of the four factors of CI, over and above demographic characteristics and EI in predicting self-rated in-role performance ($\Delta F = 6.22$, $p < 0.01$) and peer-rated in-role performance ($\Delta F = 7.58$, $p < 0.001$). Among the factors of EI, only emotional regulation was statistically significant on entry in steps 2 and 3. For self-rated in-role performance, the results demonstrated that metacognitive CI ($\beta = 0.18$, $p < 0.01$) and behavioral CI ($\beta = 0.21$, $p < 0.01$) increased explained variance over and above the effects of demographic characteristics and EI. Similarly, the results also demonstrated that metacognitive CI ($\beta = 0.24$, $p < 0.01$) and behavioral CI ($\beta = 0.18$, $p < 0.01$) increased explained variance in peer-rated in-role performance over and above the effects of demographic characteristics and EI.

5. Discussion

The primary goal of the present study was to evaluate the psychometric properties of the CI scale in the Turkish context. Our findings confirmed the reliability, factor structure, divergent, and incremental validity of the Turkish version of the CI scale. The results also indicated the discriminant validity of the four CI factors compared to the Big Five personality factors and EI factors. Moreover, CI explained additional variance in intercultural task performance over and above that explained by demographic characteristics and EI. These findings are noteworthy because they show the generalizability of the CI construct across countries.

The results of the present study highlighted several important points. First, these findings indicated strong support for the distinctiveness and the divergent validity of the CI construct compared with the Big Five person-

ality and the EI construct, which were consistent with the previous studies (Ang et al., 2006; Ang et al., 2007; Moon, 2010). Second, analyses of the findings suggested that CI increased explained variance in intercultural task performance over and above the effects of demographic characteristics and EI. Unlike the expectations, the findings indicating that only metacognitive and behavioral CI predicted intercultural task performance replicated the prior findings (e.g., Ang et al., 2007). To function effectively in cross-cultural environments, role expectations for task performance may require little cultural knowledge (i.e., cognitive CI) and little intrinsic interest and self-efficacy (i.e., motivational CI). Additional research is needed to test these predictions.

The results showed that the CI factors did not correlate strongly with GPA scores. Assuming that GPA scores reflect academic achievement of the students in domestic context, the findings of the present study coincide with previous literature and research findings. For example, Earley and Ang (2003) stated that CI focuses on specific abilities with relevance to effectiveness in culturally diverse settings (Ang & Van Dyne, 2008). Research indicated that CI did not predict effectiveness in domestic context, but did predict in cross-cultural context (Rockstuhl, Seiler, Ang, Van Dyne, & Annen, 2011). Undoubtedly, these findings indicate that CI focuses on specific domain–intercultural settings.

Previously fragmented research on intercultural competencies generally suffers from ambiguous construct definitions and poor integration (e.g., Gelfand, Imai, & Fehr, 2008); however, CI provides a theoretical and parsimonious framework, which is based on Sternberg and Detterman's (1986) integration of the multiple foci of intelligence (Ng et al., 2012). According to Sternberg and Detterman (1986), metacognition, cognition, and motivation are covert capabilities that reside within the

person, while outward manifestations or overt actions are behavioral capabilities. Applying this integration of different loci of intelligence to culturally diverse contexts, CI is conceptualized as a multidimensional construct with metacognitive, cognitive, motivational, and behavioral components (Earley & Ang, 2003). The four factors of CI are qualitatively elucidated as different aspects of the overall capability to function effectively in cross-cultural contexts (Ang et al., 2007). Ang and colleagues argued that the four factors of CI exist at the same level of conceptualization and make up the overall construct (Ng et al., 2012). In short, CI is conceptualized as an aggregate multidimensional construct. Individuals may have different levels of CI across these factors. Furthermore, some researchers (e.g., Chen, Liu, & Portnoy, 2012; Templer, Tay, & Chandrasekar, 2006) focused on specific factors of CI. This indicates that the four factors of CI affect cross-cultural outcomes independently. Specifically, understanding which factors of CI predict an outcome in culturally diverse settings is one avenue for future research.

Overall, this study provided evidence that the Turkish version of the CI scale is a reliable and valid self-report measure for assessing intercultural capabilities. The four-factor structure that underlies the original CI scale version was replicated. The reliability, divergent, and incremental validity of the Turkish version of the CI scale was also confirmed.

5.1. Limitations and future directions

Although the present study was conducted using two samples, several limitations remain. First, the sample used in this study may raise questions about the generalizability of the findings. The CI construct has never been investigated in the Turkish context before; therefore, the results found here should not be generalized until the findings have been replicated in other samples of interest.

Second, in this study, task performance was used as an outcome of CI. Research indicates that CI predicts not only performance outcomes but also a variety of beneficial outcome such as cultural and psychological adjustment, trust, and cross-border leadership potential (Ng et al., 2012). Future research could choose to test the other possible outcomes that are of central concern in studies of CI.

Third, we did not examine the relationship between CI and general cognitive ability. Earley and Ang (2003) stated that CI is not highly correlated with general cognitive ability and previous research indicated non-significant relationship among the four factors of CI and general cognitive ability (e.g., Ang et al., 2007; Ward et al., 2009). Specifically, future research efforts investigating the convergent and discriminant validity of the

scale through associations with general cognitive ability will be an important contribution.

6. Conclusion

As research on CI seems to continue gaining momentum, this shows that CI is worthy of further research. CI may have the potential to explain why some individuals are more effective than others in today's culturally diverse environments (Earley & Ang, 2003). We believe that the Turkish version of the CI scale is a reliable and valid instrument to measure individual's intercultural capabilities.

References

- Ang, S., & Van Dyne, L. (2008). Conceptualization of cultural intelligence: Definition, distinctiveness, and nomological network. In S. Ang & L. Van Dyne (Eds.), *Handbook of cultural intelligence: Theory, measurement, and applications* (pp. 3–15). Armonk, NY: M.E. Sharpe.
- Ang, S., Van Dyne, L., & Koh, C. (2006). Personality correlates of the four-factor model of cultural intelligence. *Group and Organization Management*, 31, 100–123.
- Ang, S., Van Dyne, L., Koh, C., Ng, K. Y., Templer, K. J., Tay, C., & Chandrasekar, N. A. (2007). Cultural intelligence: Its measurement and effects on cultural judgment and decision making, cultural adaptation, and task performance. *Management and Organization Review*, 3, 335–371.
- Bar-On, R., & Parker, J. D. A. (2000). *The handbook of emotional intelligence: Theory, development, assessment, and application at home, school, and in the workplace*. San Francisco, CA: Jossey-Bass.
- Benet-Martinez, V., & John, O. P. (1998). *Los Cinco Grandes* across cultures and ethnic groups: Multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, 75, 729–750.
- Campbell, J. P. (1999). The definition and measurement of performance in the new age. In D. R. Ilgen & E. D. Pulakos (Eds.), *The changing nature of performance: Implications for staffing, motivation, and development* (pp. 399–429). San Francisco, CA: Jossey-Bass.
- Chen, X., Liu, D., & Portnoy, R. (2012). A multi-level investigation of motivational cultural intelligence, organizational diversity climate, and cultural sales: Evidence from U.S. real estate firms. *Journal of Applied Psychology*, 97, 93–106.
- Crowne, K. A. (2009). The relationships among social intelligence, emotional intelligence and cultural intelligence. *Organization Management Journal*, 6, 148–163.
- Earley, P. C., & Ang, S. (2003). *Cultural intelligence: Individual interactions across cultures*. Palo Alto, CA: Stanford University Press.
- Elenkov, D. S., & Pimentel, J. R. C. (2008). Social intelligence, emotional intelligence, and cultural intelligence: An integrative perspective. In S. Ang & L. Van Dyne (Eds.), *Handbook on cultural intelligence: Theory, measurement and applications* (pp. 289–305). Armonk, NY: M.E. Sharpe.

- Gelfand, M. J., Imai, L., & Fehr, R. (2008). Thinking intelligently about cultural intelligence: The road ahead. In S. Ang & L. Van Dyne (Eds.), *Handbook on cultural intelligence: Theory, measurement and applications* (pp. 375–387). Armonk, NY: M.E. Sharpe.
- Goleman, D. (1995). *Emotional intelligence*. New York: Bantam Books.
- Hoyle, R. H., & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 158–176). Thousand Oaks, CA: Sage.
- Jöreskog, K., & Sörbom, D. (2003). *LISREL 8.54* [Computer software]. Lincolnwood, IL: Scientific Software International.
- Kim, K., Kirkman, B. L., & Chen, G. (2008). Cultural intelligence and international assignment effectiveness. In S. Ang & L. Van Dyne (Eds.), *Handbook of cultural intelligence: Theory, measurement, and applications* (pp. 71–90). New York, NY: M. E. Sharpe.
- Mayer, J. D., & Salovey, P. (1995). Emotional intelligence and the construction and regulation of feelings. *Applied and Preventive Psychology*, 4, 197–208.
- Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? P. Salovey & D. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 3–34). New York: Basic Books.
- McCrae, R. R., & Costa, P. T. (2003). *Personality in adulthood, a five-factor theory perspective* (2nd ed.). New York: Guilford Press.
- Moody, M. C. (2007). *Adaptive behavior in intercultural environments: The relationship between cultural intelligence factors and big five personality traits*. Unpublished doctoral dissertation. The George Washington University, Washington, DC.
- Moon, T. (2010). Emotional intelligence correlates of the four-factor model of cultural intelligence. *Journal of Managerial Psychology*, 25, 876–898.
- Ng, K. Y., & Earley, P. C. (2006). Culture + intelligence: Old constructs, new frontiers. *Group and Organization Management*, 31, 4–19.
- Ng, K. Y., Van Dyne, L., & Ang, S. (2012). Cultural intelligence: A review, reflections, and recommendations for future research. In A. M. Ryan, F. T. L. Leong, & F. Oswald (Eds.), *Conducting multinational research projects in organizational psychology* (pp. 29–58). Washington, DC: American Psychological Association.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.
- Rockstuhl, T., Seiler, S., Ang, S., Van Dyne, L., & Annen, H. (2011). Beyond general intelligence (IQ) and emotional intelligence (EQ): The role of cultural intelligence (CQ) on cross-border leadership effectiveness in a globalized world. *Journal of Social Issues*, 67, 825–840.
- Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25, 167–177.
- Sternberg, R. J., & Detterman, D. K. (1986). *What is intelligence? Contemporary viewpoints on its nature and definition*. Norwood, NJ: Ablex.
- Templer, K., Tay, C., & Chandrasekar, N. A. (2006). Motivational cultural intelligence, realistic job preview, realistic living conditions preview, and cross-cultural adjustment. *Group and Organization Management*, 31, 154–173.
- Thomas, D. C. (2006). Domain and development of cultural intelligence: The importance of mindfulness. *Group and Organization Management*, 31, 78–99.
- Van Dyne, L., Ang, S., & Koh, C. (2008). Development and validation of the CQS: The cultural intelligence scale. In S. Ang & L. Van Dyne (Eds.), *Handbook of cultural intelligence: Theory, measurement, and applications* (pp. 16–38). Armonk, NY: M.E. Sharpe.
- Van Rooy, D., & Viswesvaran, C. (2004). Emotional intelligence: A meta-analytic investigation of predictive validity and nomological net. *Journal of Vocational Behavior*, 65, 71–95.
- Ward, C., Fischer, R., Lam, F. S. Z., & Hall, L. (2009). The convergent, discriminant and incremental validity of the scores of a self-report measure of cultural intelligence. *Educational and Psychological Measurement*, 69, 85–105.
- Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behavior. *Journal of Management*, 17, 601–618.