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## VALIDATION OF THE CULTURAL INTELLIGENCE SCALE ON A SERBIAN SAMPLE<sup>2</sup>

This study deals with determining reliability, factorial validity, and convergent-discriminant validity of the Cultural Intelligence Scale (CQS) and its subscales on a sample of university students in Serbia ( $N = 336$ ). The convergent-discriminant validity of the scale and its four subscales are verified by testing the relationship with measures of social and emotional intelligence (Social Skills Inventory), personality (Big Five), and self-assessment of intercultural experience. The study results reveal high reliability of the scale and its subscales ( $.79 \leq \alpha \leq .90$ ), and confirm the four-factor structure of the CQS in accordance with the theoretical model that lies in its basis. In addition, the relationships of cultural intelligence measures and measures of other constructs are in line with the expectations. The correlations with measures of social and emotional intelligence are mostly statistically significant, ranging from low to moderate. Deviations from this pattern of correlations are explained by certain characteristics of the Social Skills Inventory, which imply the nature of the components of cultural intelligence at the same time. The CQS and its subscales reach the strongest correlation with Openness ( $.24 \leq .r \leq .41$ ), compared to other basic dimensions of personality, but not to an extent that would suggest that they are indicators of the same construct. The correlations of the CQS and its subscales with the measures of intercultural experience are positive and mostly statistically significant. The results, in general, support the implementation of the CQS for assessment of individual differences in the intercultural interaction in the Serbian population.

**Keywords:** CQS, psychometric properties, socio-emotional intelligence, Big Five, intercultural experience

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The construct of cultural intelligence has been presented as a unique approach to understanding intercultural interaction based on a distinct intellectual ability of the interaction participant. The cultural intelligence (CQ) is defined as “an individual’s capability to function and manage effectively in culturally diverse settings” (Ang & Van Dyne, 2008, p. 3; Ang et al., 2007, p. 336). This construct has been developed in the context of searching for good solutions in studying individual differences in intercultural interaction, on one hand, and as a part of the expansion of contemporary models of intelligence, on the other hand. The authors of this construct use a CQ<sup>3</sup> abbreviation as an analogy to the IQ abbreviation in order to remind that this is considered to be a facet of intelligence (Earley & Ang, 2003). They state that the Sternberg’s triarchic theory is their most important starting point, which emphasizes the multidimensionality of intelligence and its functioning in real-life situations (Ang & Van Dyne, 2008; Earley & Ang, 2003). They also refer to Ackerman’s concept of intelligence as knowledge (Ang & Van Dyne, 2008), and the models of “nonacademic” intelligences such as social, emotional, and practical (Ang & Van Dyne, 2008; Earley & Ang, 2003). The CQ construct indeed relies upon theories of intelligence within contemporary models, namely the expansion of intelligence beyond the cognitive abilities, but also “beyond a person”, so it cannot be defined independently of the context (Davidson & Downing, 2000; Davidson & Kemp, 2011). In addition, it is operationalized with the measures of typical behavior similar to those used in the assessment of emotional and social intelligence (Bar-On, 2000; Pérez, Petrides, & Furnham, 2005).

The most prominent CQ model is the four-dimensional model of Ang and colleagues that includes metacognitive, cognitive, motivational and behavioral component (Ang & Van Dyne, 2008; Ang et al., 2007). The metacognitive component comprised of higher-order cognitive processes, i.e. metacognitive strategies and knowledge, on the basis of which a person plans, monitors and regulates his or her thinking in the intercultural interaction. The metacognitive CQ reflects the ability of acquiring knowledge about cultures and understanding of cultures. The cognitive component consists of procedural and declarative knowledge of cultures (universals and particulars of cultures), including the knowledge of the impact that culture has on thinking and behavior of people, including the persons themselves. The motivational component is the ability to direct and maintain attention and other mental resources towards intercultural interaction. It is based on self-esteem of a person and the importance which the person gives to intercultural interaction. The motivational component is related to the intensity and direction of “mental energy”, and by introducing it the authors want to acknowledge the fact that the majority of cognitive activities are strongly influenced by motivation. The behavioral component is defined as an ability to manifest appropriate verbal and non-verbal behavior and, as such, it goes beyond the “mental” capacity.

The above mentioned model of CQ is congruent with the construct of intercultural competence to a large extent (compared to Chen & Starosta, 2008; Dear-

<sup>3</sup> Cultural Quotient.

dorff, 2006; Stone, 2006). To be precise, both constructs comprised of: (a) the cognitive domain with the integrated or independent metacognitive component (in the original CQ model, the cognitive and metacognitive components are integrated, see Earley & Ang, 2003); (b) the affective domain (in the case of CQ the focus is on motivation); and (c) the behavioral domain, i.e. plan of behavior.

For the purpose of assessing CQ, only the Cultural Intelligence Scale (CQS) (Ang et al., 2007) has been developed so far. It is composed of four subscales representing the CQ components: metacognitive, cognitive, motivational, and behavioral subscale. The aim of the CQS authors was to develop an instrument with a small number of items in order to avoid the impact of the respondents' fatigue and boredom, which still retains the satisfactory reliability (Ang et al., 2007; Van Dyne, Ang, & Koh, 2008). After the pilot study, 20 items with the best psychometric properties have been kept, making the final version of this culture-general scale. Respondents express their agreement with respect to the items on a seven-point Likert scale. In addition to the self-assessment form, there is also a version of the CQS that enables an assessment by an observer.

Although the CQS authors usually employ only scores of the subscales as more informative, they refer to the studies in which the overall CQ score is used (such as Shannon & Begley, 2008 or Tarique & Takeuchi, 2008). Indeed, the values of item-total correlations are one of the criteria for retaining the items in the process of the scale construction (Ang et al., 2007; Van Dyne et al., 2008).

In studies of the CQS authors (Ang et al., 2007; Van Dyne et al., 2008), as well as other studies (Shannon & Begley, 2008; Ward, Fischer, Zaid Lam, & Hall, 2009), it has been determined that the Cronbach's alphas of subscales ranged between satisfactory and high. The coefficients of reliability for the metacognitive subscale had values between .70 and .88, for the cognitive subscale from .76 to .89, for the motivational subscale from .70 to .86, and for the behavioral subscale from .77 to .87. In two studies of Ward and associates (for both studies see Ward et al., 2009), the reliability of the CQS total score was very high (.91 and .93), whereas in the study of Shannon and Begley (2008) it was only satisfactory ( $\alpha = .73$ ).

The confirmatory factor analysis confirmed the four-factor structure of the CQS in accordance with the presupposed theoretical model (Ang et al., 2007; Van Dyne et al., 2008). This factor structure was further confirmed in different samples and across time (Ang et al., 2007; Van Dyne et al., 2008), as well as in the data obtained by the observer ratings (Kim, Kirkman, & Chen, 2008; Van Dyne et al., 2008).

The convergent-discriminant validity of CQ measures is mainly examined in relation to the emotional intelligence manifested through the self-report measures. What both intelligences have in common is the ability to understand others and respond adequately to social interaction (Elenkov & Pimentel, 2008), which also includes the self-regulation of emotions. Measures of cultural and emotional intelligence should attain statistically significant correlations of low to moderate intensity, but the strength of these correlations should not imply that these meas-

ures are indicators of the same construct. The empirical findings regarding the relation between cultural and emotional intelligence, however, are not consistent. Ang and associates (Ang et al., 2007) conducted a study in the United States and Singapore, using the Schutte Emotional Intelligence Scale (SEIS). They demonstrated discriminant validity of CQS subscales. In the USA sample the correlations among the CQS subscales and the four dimensions of the SEIS ranged between .18 and .41, while in the Singapore sample the correlation among the CQS subscales and the shortened version of the SEIS ranged from .12 to .28. Ward and associates (Ward et al., 2009) used the same scale of emotional intelligence in its original form of 33 items, but they found much higher correlations between the measures of two intelligences on a sample of foreign students in New Zealand. The global CQS score had a correlation with the global score on SEIS of  $r = .82$ , whereas the correlations of the SEIS score with individual CQS subscales ranged between .48 and .82: with metacognitive subscale .76, with cognitive .48, with motivational .82 and with behavioral .71. Ang, Van Dyne, and Tan (2011) reported other contradictory findings that have not yet been explained. Whereas in one study CQS had a correlation with emotional intelligence scale of  $r = .31$ , and with social intelligence scale of  $r = .42$ , in another study the correlation between CQS and emotional intelligence scale reached the value of  $r = .62$ .

An important evidence of discriminant validity of the measures of “nonacademic” intelligences stems from their relations with the measures of personality. The correlation between intelligence and personality measures as a rule does not exceed the value of .30 (Altaras Dimitrijević & Jolić Marjanović, 2010; Matthews, Zeidner, & Roberts, 2007). The studies have shown that the correlations of the CQS components with the domains of Five-Factor Model of personality are in general statistically significant, but their levels are low or very low (Ang et al., 2007; Ang, Van Dyne, & Koh, 2006). The correlations with the traits of Openness and Extraversion exceed the value of .30, but not to a great extent. The maximum value of the correlation ( $r = .38$ ) is reached between Openness and motivational subscale (see Ang et al., 2006). The established relations between the CQ components and personality still do not challenge the independence of CQ, taking into account that they have a common method of measurement (self-assessment), and that deviations from the critical value are not sizeable. In addition, the openness to experience consistently occurs in the conceptualizations of constructs that explain individual differences in intercultural interaction along with the research findings proving its important role (Ang et al., 2006; Chen & Starosta, 2000, 2008; Deardorff, 2006; Matsumoto et al., 2001).

Although the numerous CQ antecedents are assumed, only some of them have been subjected to empirical verification. Those are usually some of the measures of intercultural experience based on the self-assessment. Ang and associates (Ang et al., 2007) report statistically significant correlations, which occur relatively consistently between the measures of intercultural experience and individual subscales of CQS. The correlation of intercultural experience with the metacogni-

tive subscale ranges from .15 to .34, with the cognitive subscale from .25 to .26, and with the motivational subscale from .23 to .40. In the case of the behavioral component, the same authors have found a statistically significant correlation ( $r = .23$ ) only in one study.

Among the possible antecedents of CQ, the importance of knowing one or more foreign languages was examined. It was found that the foreign language skills positively correlated ( $r = .24$ ) only with the cognitive subscale (Shannon & Begley, 2008).

## The present study

Based on the recent data analysis of the validity of instruments predicting success in the intercultural interaction, the CQS has been ranked among the three scales that have “the most promising evidence for assessing cross-cultural competence” (Matsumoto & Hwang, 2013, p. 867). Irrespective of the view that it is a measure of intelligence, the CQS is considered to be an important instrument in the assessment of individual differences in the intercultural interaction. Since Serbia lacks the instruments for estimating the likelihood of whether a person will be successful in the intercultural interaction, the goal of this study represents the analysis and verification of the possibilities for the application of the CQS in Serbia. For this purpose, an extensive psychometric evaluation of the scale has been carried out, testing its reliability, factorial validity and convergent-discriminant validity. Convergent-discriminant validity has been examined by determining relations that the CQS attains with the measures of relevant constructs: social and emotional intelligence, personality and intercultural experience. Correlations of the CQS and its subscales with the measures of social and emotional intelligence should be statistically significant, of low to moderate intensity (H1). The second hypothesis is that Openness, compared to other dimensions of personality, will most strongly correlate with the CQS and its subscales, but not to the extent that would suggest that they are measures of the same construct (H2). Finally, it is expected that the correlations of the CQS and its subscales with measures of intercultural experience will be positive, of low to moderate intensity (H3).

## Method

### Participants and Procedure

The study was conducted on a sample of 336 university students of different faculties in Belgrade, Jagodina, Čačak and Užice. The sample consisted of 84 male (25%) and 252 female respondents (75%). Their mean age was  $M = 21.46$  ( $SD = 2.56$ ). The majority of respondents were Serbian (97.6%).

In order to avoid artificial lowering of the correlation among the examined constructs, as a result of applying the instruments in different formats, the respondents answered the questionnaire with combined CQS items and items from the scale for assessing social and emotional intelligence (i.e. Social Skills Inventory).

Participation in the study was voluntary, and the respondents were motivated by being given pre-exam points and being able to receive feedback about their results on the personality inventory.

## Measures

**The Cultural Intelligence Scale (CQS: Ang et al., 2007).** The 20-item CQS was used to assess cultural intelligence and its components: metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ. The scale was translated and adapted for use in the Serbian population. All items were given in a five-point Likert scale format, and the respondents indicated the degree to which each item related to them.

**Social Skills Inventory (SSI: Riggio & Carney, 2003).** SSI was intended as a measure of basic communication skills in two domains, the nonverbal/emotional and verbal/social. It is an instrument composed of 90 items, organized into six subscales: Emotional Expressivity, Emotional Sensitivity, Emotional Control, Social Expressivity, Social Sensitivity, and Social Control. Each subscale comprised of 15 items. The authors of this inventory indicated that the measure obtained only on the basis of the emotional skills subscales could be used as a self-report measure of emotional intelligence, representing an alternative to the Schutte Emotional Intelligence Scale (the instrument was most commonly used to verify the discriminant validity of CQS). Similarly, the sum of scores on the subscales of social skills was treated as a shortened measure of social intelligence.

Having in mind that the SSI has not been standardized in Serbian language, we explored its factor structure. Following the instructions of Riggio and Carney (2003), the SSI items were firstly grouped into 18 sets (each of six subscales comprised of three sets). We used the same method of the factor analysis (EFA with varimax rotation) and found support for the six-factors model (see Appendix A) proposed by the authors of the instrument. These factors explained 73.52% of data variance.

**NEO Personality Inventory – Revised (NEO PI-R: Costa & McCrae, 1992, adapted in Serbian, Đurić-Jočić, Knežević, & Džamonja-Ignjatović, 2009).** This is a revised form of the inventory based on the Costa and McCrae's Five-Factor Model. It consists of 240 items that represent the basic dimensions of personality: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Each scale consists of 48 items.

Table 1  
Reliabilities and intercorrelations of the scales and subscales

CQS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1.CQS	<b>.90</b>																			
2.MetCQ	<b>.80**</b>	<b>.84</b>																		
3.CogCQ	<b>.80**</b>	<b>.60**</b>	<b>.79</b>																	
4.MotCQ	<b>.78**</b>	<b>.52**</b>	<b>.48**</b>	<b>.81</b>																
5.BehCQ	<b>.74**</b>	<b>.44**</b>	<b>.41**</b>	<b>.41**</b>	<b>.81</b>															
6.SSI	<b>.41**</b>	<b>.31**</b>	<b>.30**</b>	<b>.33**</b>	<b>.34**</b>	<b>.84</b>														
7.EE	<b>.06</b>	<b>.02</b>	<b>.02</b>	<b>.03</b>	<b>.10</b>	<b>.64**</b>	<b>.62</b>													
8.ES	<b>.46**</b>	<b>.35**</b>	<b>.35**</b>	<b>.37**</b>	<b>.37**</b>	<b>.68**</b>	<b>.27**</b>	<b>.80</b>												
9.EC	<b>.22**</b>	<b>.15**</b>	<b>.18**</b>	<b>.15**</b>	<b>.19**</b>	<b>.32**</b>	<b>-.15**</b>	<b>.10</b>	<b>.75</b>											
10.TE	<b>.41**</b>	<b>.29**</b>	<b>.31**</b>	<b>.31**</b>	<b>.36**</b>	<b>.87**</b>	<b>.54**</b>	<b>.75**</b>	<b>.57**</b>	<b>.83</b>										
11.SE	<b>.26**</b>	<b>.19**</b>	<b>.19**</b>	<b>.23**</b>	<b>.20**</b>	<b>.76**</b>	<b>.56**</b>	<b>.29**</b>	<b>.03</b>	<b>.44**</b>	<b>.72</b>									
12.SS	<b>.13*</b>	<b>.06</b>	<b>.04</b>	<b>.07</b>	<b>.23**</b>	<b>.18**</b>	<b>-.04</b>	<b>.29**</b>	<b>-.18**</b>	<b>.04</b>	<b>-.02</b>	<b>.78</b>								
13.SC	<b>.17**</b>	<b>.20**</b>	<b>.15**</b>	<b>.18**</b>	<b>.00</b>	<b>.63**</b>	<b>.49**</b>	<b>.23**</b>	<b>.14*</b>	<b>.44**</b>	<b>.55**</b>	<b>-.40**</b>	<b>.74</b>							
14.TS	<b>.31**</b>	<b>.25**</b>	<b>.21**</b>	<b>.27**</b>	<b>.23**</b>	<b>.87**</b>	<b>.57**</b>	<b>.44**</b>	<b>.00**</b>	<b>.52**</b>	<b>.88**</b>	<b>.27**</b>	<b>.66**</b>	<b>.78</b>						
NEO-PI-R	<b>-.18**</b>	<b>-.22**</b>	<b>.20**</b>	<b>-.15**</b>	<b>-.02</b>	<b>-.16**</b>	<b>-.01</b>	<b>.00</b>	<b>-.22**</b>	<b>-.13*</b>	<b>-.21**</b>	<b>.47**</b>	<b>-.46**</b>	<b>-.14*</b>	<b>.90</b>					
16.E	<b>.17**</b>	<b>.14**</b>	<b>.10</b>	<b>.18**</b>	<b>.10</b>	<b>.56**</b>	<b>.53**</b>	<b>.19**</b>	<b>-.06</b>	<b>.32**</b>	<b>.71**</b>	<b>-.12*</b>	<b>.56**</b>	<b>.66**</b>	<b>-.34**</b>	<b>.86</b>				
17.O	<b>.40**</b>	<b>.28**</b>	<b>.30**</b>	<b>.41**</b>	<b>.24**</b>	<b>.38**</b>	<b>.21**</b>	<b>.35**</b>	<b>.07</b>	<b>.34**</b>	<b>.23**</b>	<b>.00</b>	<b>.37**</b>	<b>.33**</b>	<b>-.15**</b>	<b>.36**</b>	<b>.87</b>			
18.A	<b>.04</b>	<b>.02</b>	<b>-.02</b>	<b>.10</b>	<b>.01</b>	<b>-.15**</b>	<b>-.17**</b>	<b>.03</b>	<b>-.25**</b>	<b>-.21**</b>	<b>-.10</b>	<b>.12*</b>	<b>-.10</b>	<b>-.05</b>	<b>-.08</b>	<b>.05</b>	<b>.20**</b>	<b>.85</b>		
19.C	<b>.25**</b>	<b>.26**</b>	<b>.19**</b>	<b>.17**</b>	<b>.16**</b>	<b>.21**</b>	<b>-.02</b>	<b>.31**</b>	<b>.07</b>	<b>.21**</b>	<b>.05</b>	<b>-.09</b>	<b>.35**</b>	<b>.16**</b>	<b>-.48**</b>	<b>.22**</b>	<b>.21**</b>	<b>.18**</b>	<b>.93</b>	

Note. CQS = Cultural Intelligence Scale; MetCQ = Metacognitive cultural intelligence; CogCQ = Cognitive cultural intelligence; MotCQ = Motivational cultural intelligence; BehCQ = Behavioral cultural intelligence; SSI = Social Skills Inventory; EE = Emotional Expressivity; ES = Emotional Sensitivity; EC = Emotional Control; TE = Emotional subscales total score; SE = Social Expressivity; SS = Social Sensitivity; SC = Social Control; TS = Social subscales total score; N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness.

\*\*  $p < .01$ . \*  $p < .05$ .



**Questionnaire on Intercultural Experience.** A nine-item questionnaire was used in order to examine the type and frequency of direct and indirect intercultural experiences. Two questions were open-ended: the number of visited countries and the number of foreign languages a person can communicate either fully or to a greater extent. The question regarding having friends from other cultures was dichotomous, and the question regarding the ability to communicate in a foreign language had four possible answers. All the other questions were given in a five-point Likert-scale: the frequency of contacts with people from other cultures, listening to programs in a foreign language, reading texts in a foreign language, listening to foreign music, watching or reading travelogues.

Reliabilities (Cronbach's alphas) of the used instruments were presented in Table 1.

## Results

### Reliability

A diagonal in Table 1 (and in bold typeface) shows the values of the reliability coefficients for all instruments administrated in this study and their subscales. The value of Cronbach's alpha for CQS as a whole is .90, whereas for its subscales it ranges from .79 to .84. Generally speaking, about two-thirds of the coefficients have a high or very high value ( $.80 \leq \alpha \leq .93$ ), while a smaller number indicates the satisfactory level of reliability ( $.72 \leq \alpha \leq .79$ ). Only the subscale of Emotional Expressivity has a lower alpha with a value of  $\alpha = .62$ .

### Factorial validity

Besides testing the four-factor model by means of the confirmatory factor analysis (Amos, ver. 19), two additional solutions were included, based on relatively high intercorrelations between the CQS subscales (see Table 1): one-factor model and three-factor model (metacognitive and cognitive factors were merged within the three-factor model). These solutions were also examined in some of the previous CQS studies (Ang et al., 2007; Van Dyne et al., 2008; Ward et al., 2009). The results of these analyses, and the analyses of the authors' scale, are presented in Table 2. The four-factor structure provided the best fit for the data, and therefore our study confirmed the original CQS structure (see Figure 1). Although the value of chi-square was statistically significant, its ratio with the number of degrees of freedom was less than two, which was considered as desirable (Ullman, 2007). Compared with the original findings (Ang et al., 2007), there were found more adequate fit indices, which were slightly less favorable than the findings in the second sample (Van Dyne et al., 2008). Further on, standardized factor loadings for items in the four scales (.41–.87) corresponded to the findings



of the scale authors (.52–.80/.50–.79) (Ang et al., 2007; Van Dyne et al., 2008). On the other hand, intercorrelations of factors (.50–.75) were notably higher than those identified within the original scale (.21–.45/.23–.37). The factors' variance was lower (0.34–0.70) than the factors' variance in the original studies (0.75–1.03/0.87–1.05).

Table 2

*Fit statistics for confirmatory factor analysis models*

Model	$\chi^2$ ( <i>df</i> )	<i>p</i>	SRMR	TLI	CFI	RMSEA
One-factor	918.22 (170)	.000	.11	.68	.71	.12
Three-factor	400.93 (167)	.000	.06	.90	.91	.06
Four-factor	278.85 (164)	.000	.05	.95	.96	.05
Four-factor (Ang et al., 2007)	822.26 (164)	.000	.06	.91	.92	.08
Four-factor (Van Dyne et al., 2008)	381.28 (164)	.000	.04	.96	.96	.05

*Note.*  $\chi^2$  = Chi square test; *df* = degrees of freedom; SRMR = Standardized Root Mean Square Residual; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

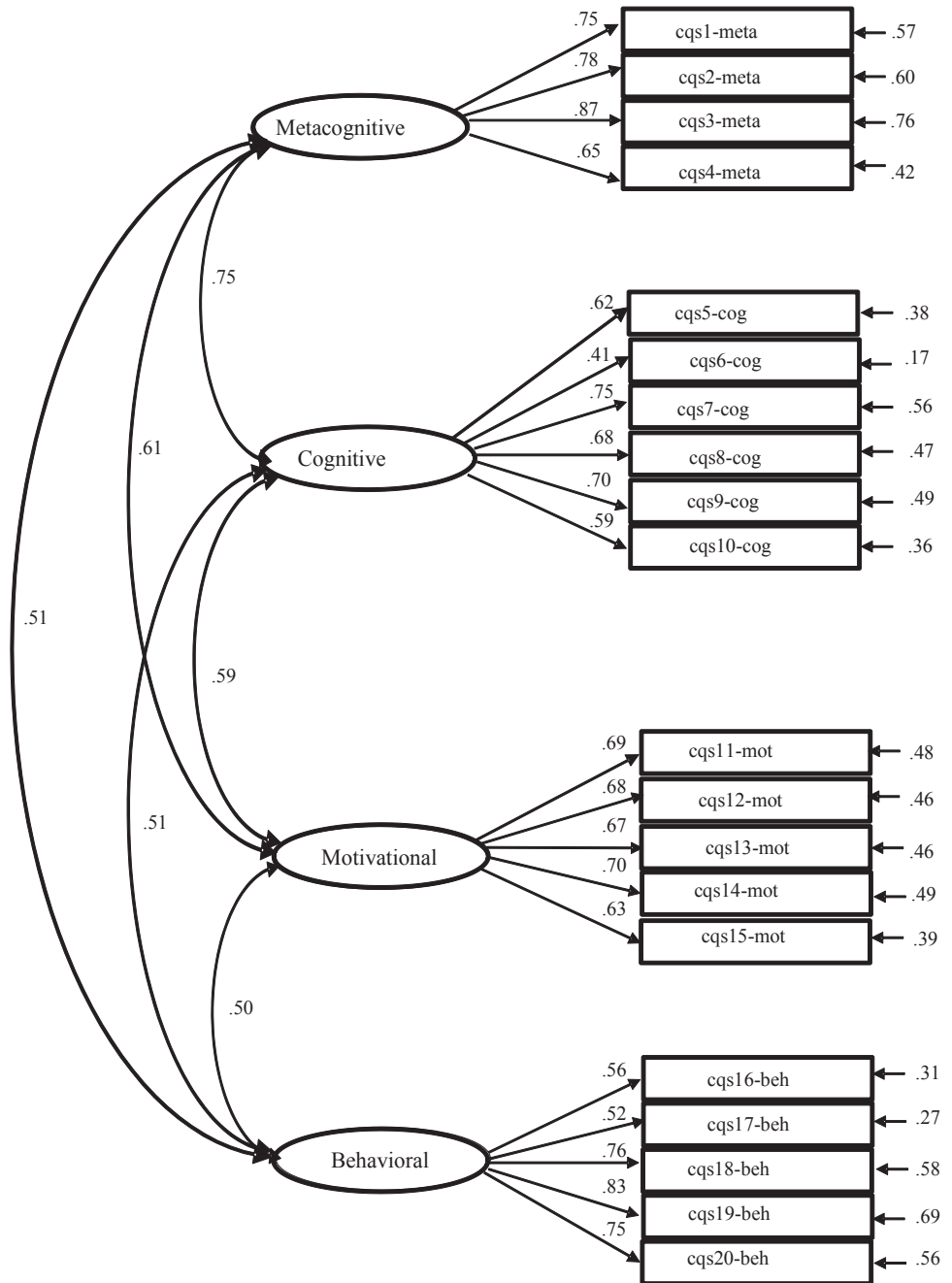


Figure 1. Factor loadings for 20 CQS items with factors' correlations.

## Convergent and discriminant validity

**Relationships with SSI.** The CQS global score and the CQS subscales scores are in a positive and statistically significant correlation with SSI (.30–.41), as well as with the shortened measures of emotional (.31–.41) and social intelligence (.21–.31) (Table 1). The CQS global score is also in a positive and significant correlation with the SSI subscales (.13–.46), except for the subscale of Emotional Expressivity. Moreover, this SSI subscale does not correlate significantly with any CQS subscale. The results further indicate that most correlations of the subscales of Social Sensitivity with the CQS subscales are not statistically significant. In addition, there is an unexpected zero correlation between the Social Control subscale and the CQS behavioral subscale. However, taken as a whole, low to moderately high correlations, which are statistically significant, prevail among the CQS and the SSI, including their subscales.

**Relationships with NEO-PI-R.** The CQS global score correlates significantly with four of the five basic personality dimensions (Table 1). These correlations are positive for dimensions of Openness, Extraversion, and Conscientiousness, while the correlation between the CQS global score and Neuroticism is negative. A similar pattern of correlations applies to the CQS subscales, except when it comes to Neuroticism correlating with the CQS cognitive subscale (they correlate positively), and the CQS behavioral subscale (they do not correlate at all). The CQS and its subscales reach the strongest correlation with the dimension of Openness (.24 ≤  $r$  ≤ .41).

**Relationships with Intercultural Experience.** Correlations of the CQS global score with the self-report measures of intercultural experience are positive and statistically significant (.14–.38) (Table 3). Similar applies to the CQS subscales scores: out of 36 possible correlations, 30 of them reach the level of statistical significance, while 20 correlations have a value of  $r > .20$ .

Table 3  
*Correlations of the CQS and its subscales with measures of intercultural experience*

	CQS	Metacognitive CQ	Cognitive CQ	Motivational CQ	Behavioral CQ
visited countries	.14*	.11*	.10	.16**	.06
communication	.26**	.18**	.28**	.21**	.14**
number of languages	.16**	.10	.19**	.12*	.07
contacts frequency	.38**	.27**	.29**	.36**	.25**
listening programs	.25**	.13*	.27**	.23**	.12*
reading texts	.29**	.20**	.31**	.25**	.14*
listening music	.14*	.04	.12*	.15**	.08
travelogues	.28**	.21**	.25**	.27**	.15**
having friends <sup>1</sup>	.25**	.16**	.17**	.30**	.15**

<sup>1</sup>  $r_{pb}$  = point biserial correlation.

\*\*  $p < .01$ . \*  $p < .05$ .

## Discussion

Developing and maintaining harmonious relations with people from different cultures, efficiently achieving business goals in the intercultural context, successfully adapting to new cultures, and other similar issues, are becoming increasingly important in the modern age. There is the understanding that these outcomes are the result of a distinct intellectual ability, i.e. cultural intelligence. The aim of this paper is not to verify justification of this understanding, but to examine various aspects of the validity of the cultural intelligence scale that can also be seen as a measure of competence for intercultural interaction. We wanted to know whether this short instrument has adequate reliability, whether its factor structure is reproduced when translated into Serbian and applied in a different cultural context, and whether it attains expected relationships with measures of other constructs, which are in accordance with the nature of the concept and do not endanger its independence.

The results of this study have shown high reliability of CQS and its subscales (Table 1), which is consistent with the findings of most studies (Ang et al., 2007; Van Dyne et al., 2008; Ward et al., 2009). This study has also established the high or very high reliability of measures of basic personality dimensions. On the other hand, the four subscales of SSI have only a satisfactory level of reliability, and

Emotional Expressivity is even lower than that. However, the SSI constructors have found that this subscale often has the alpha lower than .70 (Riggio & Carney, 2003). Therefore, the finding of our study is not an exception, but it possibly suggests the need for revision of this subscale. In addition, for the purpose of this study, the results regarding the reliability of SSI as a whole are the most relevant, as well as the shortened measures of emotional intelligence (the sum of scores on the emotional skills subscales). They are of interest because of the inconsistent findings concerning the CQS discriminant validity. It has been determined that the reliability of the SSI as a whole is good, as well as its emotional skills subscales, so that we can rely on these measures in examining the construct validity of the CQS.

The four-factor structure of the CQS has been confirmed, which lends support to the theoretical model and is consistent with the findings of the scale constructors (Ang et al., 2007; Van Dyne et al., 2008). Fit indices have more favorable values than those established during the development of the scale, and less adequate ones than the findings in the second sample (Ang et al., 2007; Van Dyne et al., 2008). However, they fully meet the standards of SEM analysis (Hu & Bentler, 1999; Ullman, 2007). If we take into account the size of the sample ( $N = 336$  versus  $N = 576$  and  $N = 447$  in the studies of the scale constructors), the results are additionally convincing, because the smaller samples may allow lower optimal cut-off values (Sivo et al., 2006). The strength of the connections among certain factors suggests that they are not as distinguishable as in the case of the original scale, but these connections still do not compromise the scale's four-factor structure (Figure 1). The very strong relationship exists only between the metacognitive and cognitive factors ( $r = .75$ ), which is not surprising when their close conceptual links are taken into consideration.

The verification of the construct validity of the CQS has also yielded positive results. The established connections of the CQS and its subscales with the measures of social and emotional intelligence are in line with the expectations (H1), where the majority reach the level of statistical significance of low to moderate intensity ( $r \leq .41$ ) (Table 1). It is particularly interesting to relate this finding to the inconsistent results from previous discriminant validity studies of the CQS that used the scale of emotional intelligence. Assuming that the score on the emotional skills subscales can be considered as an alternative measure of emotional intelligence (Riggio & Carney, 2003), the results of this study support the findings of the CQS constructors, i.e. speak in favor of its distinctiveness. This conclusion is strengthened by the way of administration of these instruments, as a single questionnaire with combined items.

The findings of this study also reveal a small number of low correlations of the CQS and its subscales with the SSI subscales. These results can be partly explained by low reliability of the Emotional Expressivity subscale. The second reason is linked with some specifics of the SSI. There are very low or negative correlations between certain the SSI subscales (such as Social Sensitivity and Social Control), and according to the constructors of this scale, this is possible because the possession of one skill interferes with or inhibits the development of another

(Riggio & Carney, 2003). Thus the fact that the CQS subscales can have significant correlations with certain the SSI subscales, and very low or zero correlations with their “antipode”, is not unusual, or at least does not suggest unsatisfactory convergent validity of the CQS. Generally speaking, the CQS subscales are linked with the measures of emotional sensitivity and control, social expressiveness, and social control. The behavioral CQS subscale deviates from this pattern in a way that it is linked with the measure of social sensitivity, and not with the measure of social control (where the negative correlation is striking). The determined relations enable analysis and understanding of the CQ components from the perspective of socio-emotional skills.

The results of this study also support the second hypothesis that the CQS and its subscales will have the highest correlations, but not too high, with the dimension of Openness (Table 1). The determined correlations of the CQS and its subscales with measures of personality are not fully consistent with the previous findings (Ang et al., 2006). Ang and associates (Ang et al., 2006) have found non-significant correlations between Neuroticism and CQS subscales, except for the motivational subscale. It has correlated positively and significantly with Neuroticism, although the value of correlation is very low ( $r = .14$ ). In our study, metacognitive and motivational subscale, as well as the scale in general, exhibit statistically significant negative correlation with Neuroticism (for the scale in general, as far as we know, there are no previous data), but the cognitive subscale correlates positively with this measure of personality. Nevertheless, we believe that these results are not contrary to theoretical expectations in a large part. It is conceivable that lower level of Neuroticism is linked with more successful functioning of metacognition in the intercultural interaction, as well as with the stronger motivation for contacts with members of different cultures. A finding from a previous study may indirectly support the established negative correlations of the CQS and its subscales with Neuroticism. It is shown that in fact people with less expressed need for control, which would be the expected characteristic of people with lower Neuroticism, more efficiently “use” the previous intercultural experience, and subsequently achieve higher scores on the CQS subscales (Tay, Westman, & Chia, 2008). Not surprisingly, Neuroticism expresses either negative correlations in our study, or it does not correlate with the SSI and its subscales, except in the case of the measure of social sensitivity. However, the positive correlation between Neuroticism and cognitive CQ needs further investigations in order to be explained.

The nine self-report measures of intercultural experience, which have been used in this study, present a significantly higher number of experience indicators than in the previous studies (up to three measures). By applying various measures, we wanted to deepen the knowledge about what types of intercultural experience are associated with CQ and its components. We have included both the measures of immediate experience (e.g. the number of visited countries, having friends from other cultures) and the measures of indirect experience (e.g. reading texts in a foreign language, listening programs in a foreign language). The established correla-

tions have confirmed the third hypothesis in the study, since they are all positive, and most of them are statistically significant. By respecting the view of intercultural experience as one of the CQ antecedents (Van Dyne & Ang, 2008; Shannon & Begley, 2008), the determined links, especially more prominent ones, suggest the ways to facilitate the development of CQ dimensions, although it is impossible to draw final conclusions about a causal relations of variables based on the correlations.

The established relations of intercultural experience and the CQS subscales are in line with the findings of two studies of Ang and associates (Ang et al., 2007), who have also found the strongest correlations of experience with the motivational and cognitive subscale, and the weakest correlation with the behavioral subscale. It is likely that the changes in terms of behavior (improved verbal and nonverbal skills in the intercultural interaction) occur only after a more permanent and intense intercultural experience.

## Conclusion

Since the findings of this study are largely consistent with the findings of the scale constructors, one can conclude with great certainty that the CQS measures the same construct in different cultural contexts. High reliability, equivalence of the factor structure, as well as the satisfactory convergent-discriminant validity, suggest that the CQS could be applied on the population in Serbia for assessing individual differences in the intercultural interaction. However, it would be important to link future studies of the CQS validity with other measures of competence in the intercultural interaction, as well as with real-life situations.

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## Appendix A

Table A1

*Rotated factor matrix with factor loadings on six factors of the SSI*

Set of items	Factors (% explained variance)					
	1 (13.92)	2 (13.29)	3 (13.20)	4 (11.61)	5 (11.52)	6 (9.99)
ES2	<b>.878</b>	.060	-.007	.070	.114	.063
ES1	<b>.803</b>	.085	.272	.150	.053	.011
ES3	<b>.787</b>	.016	-.020	.248	.176	.068
EC3	.014	<b>.846</b>	.098	-.037	-.020	-.113
EC1	.136	<b>.845</b>	.048	-.070	.028	-.077
EC2	-.027	<b>.827</b>	-.151	-.104	.140	.105
SE1	-.034	-.070	<b>.853</b>	.006	.196	.042
SE2	.150	.042	<b>.794</b>	-.003	.222	.307
SE3	.228	.085	<b>.682</b>	.055	.298	.305
SS2	.000	-.258	-.171	<b>.791</b>	-.101	.021
SS3	.221	-.052	.146	<b>.773</b>	-.226	-.095
SS1	.246	.059	.071	<b>.766</b>	-.194	.018
SC2	.190	.072	.185	-.213	<b>.792</b>	.101
SC1	.180	.097	.267	-.138	<b>.717</b>	.212
SC3	.005	-.004	.281	-.312	<b>.695</b>	.241
EE2	.101	.130	.131	-.030	.277	<b>.798</b>
EE1	-.022	-.204	.260	.004	.166	<b>.760</b>
EE3	.432	-.330	.342	-.089	-.028	<b>.483</b>

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**VALIDACIJA SKALE KULTURALNE INTELIGENCIJE NA SRPSKOM UZORKU**

Kulturalna inteligencija predstavlja sposobnost pojedinca da uspešno funkcioniše u interkulturnoj interakciji. Najpoznatiji model kulturalne inteligencije predstavlja je kao četvero-dimenzionalnu sposobnost koju čine metakognitivna, kognitivna, motivaciona i bihevioralna komponenta. Za procenu kulturalne inteligencije razvijena je Skala kulturalne inteligencije sastavljena od 20 stavki i četiri podskale koje predstavljaju dimenzije ovog konstrukta. Mada postoje neslaganja u pogledu toga da li se skalom procenjuje inteligencija ili kompetentnost, ovaj instrument je svrstan među tri upitnika sa najboljom empirijskom osnovom za procenu individualnih razlika u interkulturnoj interakciji. Cilj ovog istraživanja predstavlja proveru mogućnosti za primenu Skale kulturalne inteligencije u Srbiji. Istraživanje je sprovedeno na uzorku od 336 studenata različitih fakulteta u Beogradu, Jagodini, Čačku i Užicu. Na osnovu prikupljenih podataka izvršena je opsežna psihometrijska evaluacija skale i njenih podskala što je podrazumevalo proveru unutrašnje konzistentnosti, faktorske strukture i konvergentno-diskriminativne valjanosti. Konvergentno-diskriminativna valjanost ispitana je utvrđivanjem odnosa koje skala u celini i četiri podskale ostvaruju sa merama relevantnih konstrukata: socijalno-emocionalne inteligencije (Inventar socijalnih veština), ličnosti (NEO-PI-R) i interkulturnog iskustva (upitnik). Prethodni nalazi nesaglasni su u pogledu odnosa kulturalne i emocionalne inteligencije – pojedini podržavaju, a drugi osporavaju njihovo međusobno razlikovanje. Inventar socijalnih veština omogućava dobijanje skraćene mere emocionalne inteligencije koja se smatra alternativnom u odnosu na najčešće korišćenu meru emocionalne inteligencije prilikom ispitivanja diskriminativne valjanosti skale, a obezbeđuje i skraćenu meru socijalne inteligencije. Kako bi se izbeglo artificalno snižavanje korelacije usled zadavanja instrumenata u različitom formatu, Skala kulturalne inteligencije i Inventar socijalnih veština zadati su u formi jedinstvenog upitnika sa međusobno izmešanim tvrdnjama. U istraživanju je primenjeno i devet mera samoprocene interkulturnog iskustva, što predstavlja značajno veći broj u odnosu na broj mera o kojima se uobičajeno izveštava (do tri). Izabrane mere predstavljaju indikatore kako neposrednog, tako i posrednog iskustva sa drugim kulturama. Rezultati istraživanja pokazuju da Skala kulturalne inteligencije i podskale poseduju visoku unutrašnju konzistentnost ( $.79 \leq \alpha \leq .90$ ). Konfirmatornom faktorskom analizom je potvrđena četvo-

rofaktorska struktura skale, SRMR = .05, TLI = 0.95, CFI = .96, RMSEA = 0.05, mada postoji visoka korelacija između metakognitivnog i kognitivnog faktora ( $r = .75$ ). Odnosi između mera kulturalne inteligencije i mera drugih konstrukata podržavaju pretpostavku o nezavisnosti kulturalne inteligencije, ali istovremeno potvrđuju povezanost tamo gde je to očekivano na osnovu teorijskih pretpostavki i prethodnih empirijskih nalaza. Korelacija sa merama socijalno-emocionalne inteligencije uglavnom je statistički značajna, niskog do umerenog intenziteta. Pojedine veoma niske ili nulte korelacije objašnjene su određenim karakteristikama Inventara socijalnih veština i ujedno impliciraju prirodu komponenti kulturalne inteligencije. Generalno gledano, skala i podskale su povezane sa merama emocionalne senzitivnosti i emocionalne kontrole, socijalne ekspresivnosti i socijalne kontrole. Bihevioralna podskala odstupa od ovog obrasca u tom pogledu što je ona povezana sa merom socijalne senzitivnosti, a ne sa merom socijalne kontrole. Kada je reč o odnosu sa merama ličnosti, skala u celini i podskale ostvaruju najsnažniju korelaciju sa dimenzijom Otvorenosti ( $.24 \leq r \leq .41$ ). Ovaj nalaz je očekivan budući da se otvorenost prema iskustvu dosledno javlja u konceptualizaciji diferencijalno-psiholoških konstrukata u interkulturnoj interakciji i u nalazima istraživanja kao njihov korelat. Na zadovoljavajuću konvergentnu valjanost Skale kulturalne inteligencije i podskala ukazuju i utvrđene pozitivne i dominantno statistički značajne veze sa merama neposrednog i posrednog interkulturnog iskustva. Rezultati studije u celini podržavaju primenu Skale kulturalne inteligencije za ispitivanje individualnih razlika u interkulturnoj interakciji na populaciji u Srbiji.

**Ključne reči:** Skala kulturalne inteligencije, psihometrijske karakteristike, socijalno-emocionalna inteligencija, „Pet velikih”, interkulturno iskustvo