Empirical Research

Adaptation and Validation of the Cultural Intelligence Scale (CQS) in the Amharic Version of Ethiopia (CQS–AE)

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Abstract

The study aimed at the translation of the Cultural Intelligence Scale (CQS), which was developed by Van Dyne, Ang and Koh [24], into the Ethiopian Amharic version (CQS–AE), and validation of its psychometric properties, factor structure, and the hypothesized measurement model on a sample of public university students. Senior undergraduate students (n = 343), who were from different backgrounds, participated in the study. Factor structure and model fitness, construct reliability and validity, and correlation between factors were examined. Results of EFA revealed that CQS–AE is a four-factor structure as the original CQS, showing metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ. Except for two items of the metacognitive factor, all the rest items had a strong loading value of greater than .6. There were no cross-loadings either. CFA of the four CQ factors demonstrated acceptable model fit ($\chi 2$ 162df) = 272.30, NFI = .863, CFI = .938, PCFI = .800, and RMSEA = .063 ($p > .05$). Internal consistency reliability of the factors yielded Cronbach's alpha ranging from .81 to .88. Analyses of AVE was above .50 and exceeded the square of the correlations with other CQ factors (0.21 – 0.42), showing convergent and discriminant validity of the constructs. The overall result of the study demonstrated that the CQS–AE is valid and reliable enough to measure CQ on public university students of Ethiopia.

Keywords: Cultural Intelligence Scale (CQS), Adapted Amharic version of Ethiopian (CQS–AE), CQS–AAE Validation, Cultural Intelligence Scale (CQ) Validation Studies.

Introduction

The rising of curiosity in exploring new types of intelligence has resulted in discovering new and specific forms of intelligence, such as Cultural Intelligence [7], Practical Intelligence [21], Emotional Intelligence [4, 11], Fluid and Crystallized Intelligence [6], and Social Intelligence [24].

Cultural Intelligence (CQ), as a specific form of intelligence, is the ability to grasp, reason, and behave effectively in situations characterized by cultural diversity [2]. These capabilities of individuals include the acceptance of a certain degree of cross-cultural confusion, the suspension of a judgment of cultural values, and a desire to understand cultural differences [5]. It also includes individuals' ability to adapt and thrive in a different environment they didn't come across. In that sense, groups that comprise people with high levels of CQ can function effectively because there will be better understanding among members, celebrating commonalities and respecting differences.

People became curious to know why some individuals are more effective than others in different situations, including work settings, as the workforce becomes more diverse and the world becomes more globalized. To answer such questions, scholars theorized about CQ. They revealed that it is a multidimensional concept, comprising metacognitive CQ, cognitive CQ, motivational CQ and behavioral CQ, affecting individuals' behavior and their functionality in a group [7]. It is summative of these dimensions, which differ qualitatively, to function effectively in culturally diverse settings and manage differences successfully.

Scholars stressed that the four dimensions of CQ imply, not only multiple types of knowledge– understanding of a body of information– and skills– mastery of an application of knowledge– it also involves both cognitive and metacognitive (knowledge of and control over one's thinking and learning) dimensions [23].

Dimensions of CQ

CQ is conceptualized as a cumulative of metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ facets. Metacognitive CQ refers to an individual's higher level of consciousness and cultural awareness during cross-cultural interactions. Individuals with higher metacognitive CQ reflect throughout conversations, actively challenge their cultural

presumptions, and modify their cultural knowledge when interacting with others from a different culture. They can regulate their mental process and cultural knowledge. Before and during encounters, people with high metacognitive CQ are cognizant of the cultural preferences and norms of various societies. Moreover, these people challenge cultural presumptions and amend their mental models during and after pertinent encounters [7].

People with higher cognitive CQ reflect knowledge of cultural norms, customs, and practices that have been gained via education and personal encounters. As a result, the cognitive component of CQ describes a person's level of cultural literacy or awareness of the cultural milieu. Knowing oneself as rooted in the cultural framework of one's surroundings is a component of cultural knowledge. Given the wide variety of cultures in the contemporary world, cognitive CQ indicates knowledge of cultural universals as well as knowledge of cultural differences [7].

People with higher motivational CQ organize their thoughts and vitalities toward learning and work in circumstances characterized by cultural diversity. They can direct and invest their attention in a cross-cultural state of affairs for intrinsic motives. This dimension of CQ triggers efforts and energies toward functioning in novel cultural settings.

Behavioral CQ is the last but not the least component of CQ. People with this specific dimension of CQ can display appropriate verbal and nonverbal behaviors when interacting with others from different cultures. Behavioral CQ is a basic component of CQ since verbal and nonverbal behaviors are the foremost prominent features of social interactions. Because behavioral expressions are particularly significant in cross-cultural encounters, the behavioral component of CQ can be the most critical factor that observers use to evaluate others' CQ [2; 7].

Psychometric Properties

The Cultural Intelligence Scale (CQS), which was originally developed and validated by Van Dyne, Ang and Koh [23], across samples, time and countries with three cross-validation works on samples of undergraduate students in Singapore and in the U.S. It has 20 items covering the four dimensions of CQ (metacognitive CQ, cognitive CQ, motivational CQ and behavioral CQ). There are four items for metacognitive CQ ($\alpha = .76$); five items for behavioral CQ ($\alpha = .83$); five items for motivational CQ ($\alpha = .76$); and six items for cognitive CQ ($\alpha = .84$).

All CQS items are measured on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The higher the score, the higher the level of CQ.

Subsequent studies have supported the psychometrics, factor structure validity, and generalizability of the CQS. The four-factor structure has been replicated across multinational samples [16; 17; 23] and multiple countries including India [9], Korea [12], the Philippines [14], Turkey [15], and Saudi Arabia [1]. Across studies, the CQS showed good internal consistency reliability.

The CQS was also adapted to the Portuguese population [18, yielding adequate psychometric characteristics. A modified 10-item short form of the CQS (SFCQ) was also created in 5 languages: English, French, Indonesian, Turkish, and traditional Chinese [22]. The authors concluded that the SFCQ scale was the interaction of lower-order factors: knowledge (2 items), skills (5 items), and metacognition (3 items).

Current Study

Although the CQS has been validated and used in many more countries (e.g., Croatia, Italy, Portugal, USA, Singapore, Serbia, China, Persia and Congo), to the best of our knowledge, it has not been yet translated, systematically examined and validated for the Amharic-speaking population, which is estimated to be over 60 million in Ethiopia. Consequently, the current study aimed to examine the CQS–AE of the CQS and validate the underlying factor structure, model fitness, construct reliability and validity and correlation between factors, and if it is consistent with the previous studies of the CQS, using a youth sample in Ethiopian public university setting.

Materials and Methods

Participants and Procedure

Three hundred forty-three senior regular undergraduate students, who stayed in a university for three years and more, participated in the current study. We did not include students in graduate, postgraduate and non-regular programs. We infused this inclusion-exclusion criterion in order to tackle the likelihood of problems associated with students' lack of cross-cultural experiences, on one hand, and the possible presence of inflated gaps among them on the attributes, on the other hand, as CQ is influenced by these underlying characteristics. We drew the sample from fourth-year students of Psychiatry Nursing, fifth-year students of Electrical

Engineering and Architecture, third-year students of Civics Education and Journalism, fourth-year students of Midwifery, and third-year students of Accounting for the 2021/2002 academic year at Dire Dawa and Wollo universities of Ethiopia. The data collection was carried out in April and June 2022.

Instrument

We used the Adapted version of the CQS (i.e., CQS–AE), exposing the participants to the instrument prepared both in English and Amharic languages. Except for a few, it was reported that almost all of them used the Amharic version. It is a self-report measure with a 7-point degree of agreement, ranging from 1 (strongly disagree) to 7 (strongly agree). One of the problems of the original CQS was that it has been presented as a generic tool to capture cultural intelligence in a general notion. This limitation has been alleviated in the present study by modifying and customizing the items in the Ethiopian context, employing experts. In the adaptation process, it was tried to include prominent samples of cultures of Ethiopia in each of the CQS dimensions. Experts who had exposure and knowledge about the different cultures of Ethiopia did the adaptation task.

The reliability coefficients of the CQS–AE dimensions of metacognitive CQ, cognitive CQ, motivational CQ and behavioral CQ were found Cronbach's alpha .81, .87, .88 and .88 respectively. The overall reliability coefficient of the 20 items of the CQS–AE was .92.

Data Analyses

We used IBM SPSS version 25 and IBM SPSS AMOS 23 for analyzing the statistics. Data screening and assumptions checking for the univariate and multivariate levels of statistical analyses were conducted first. Two items (Code 147 & 187) were discarded from the analysis at the initial stage because they had missing values of 36.4% and 20% respectively. A few outlying cases were found, albeit they were not excluded from the multivariate analyses, as keeping them in the data did not result in errant data outcomes. Hence, normality, linearity and homoscedasticity, singularity, multicollinearity and multivariate outliers were checked in the data screening processes initially.

To inspect the number of factors that underlie the set of items of the CQS–AE, the scale was subject to Exploratory Factor Analysis (EFA). Because the CQS–AAE factors are assumed they are correlated with one another, Oblique rotation was employed. To determine the number of factors to be retained, we used the Kaiser criterion of extraction of components that had eigenvalues of greater than 1 and parallel analysis as well. Following the EFA, to make the validation work more robust, we conducted Confirmatory Factor Analysis (CFA) to know if the hypothesized measurement model actually fit with the current data.

Results

Descriptive

One hundred five (30.7%) participants were female, and 237 (69.3%) were male. One student did not mention her or his sex. In terms of the original area of residence where participants had come from, 133 (38.8%) were from rural and 194 (56.6%) were from urban areas of Ethiopia. Thirteen participants did not describe their area of residence. It was also found that 35 (10.2%), 56 (16.3%) and 246 (71.7%) participants were from high, low and medium family socioeconomic backgrounds respectively. Two participants did not respond to the question about their family socioeconomic status.

Furthermore, the descriptive statistics result (Table 1) provides a summary of the information about the factors of the CQS–AAE. For example, for metacognitive CQ of the CQS–AAE, the data was obtained from 343 respondents, ranging scores from 6 to 28, (M = 21.98, SD = 4.54). Likewise, for the overall CQS–AE, it was found (M = 103.21, SD = 19.70) with a minimum and maximum value of 33 and 140 respectively.

To check outliers, we inspected the Histogram and the Boxplot. A few data points were found sitting on their own on the Histogram. However, there were too few to assume them as potential threats to the PCA and to the correlational analyses. Four cases (Code 090, 134 & 104) were found outlying cases. However, the information in the descriptive statistics (Table 1) gives us a sign of how much of a problem they would likely be. The difference between the *5% Trimmed Mean* and the *Mean* is an important indication. If the two mean values are significantly different, these data points need to be held on for further investigation. Here, the two mean values of the CQS–AE were (M = 103.21 & *Trimmed Mean* = 103.98), which cannot be taken as very different. The implication is that the values were not very much different from the

remaining distribution. Because removing such cases is not advisable, they were retained in the study.

Table 1

Descriptive Statistics

	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Metacognitive CQ	343	6	28	21.98	4.544
Cognitive	343	6	42	27.66	7.781
Motivational CQ	343	5	35	27.58	6.207
Behavioral CQ	343	5	35	25.99	6.445
Overall CQS–AE	343	33	140	103.21	19.704

Note. 5% Trimmed Mean =103.98

Exploratory Factor Analysis

In the present research, EFA was mainly conducted to answer the question "What is the underlying factor structure of the CQS–AAE?" Prior studies [9, 16, 23] indicated that CQ is a four–factor construct, including metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ. The data was split into two halves to conduct EFA and CFA in independent data sets. The suitability of the data for the statistical analysis of factors was first assessed. Sample size, correlational strength of the items, linearity, and outliers among cases were mainly checked. The KMO value reached .894, and Bartlett's Test of Sphericity tests was found at $p < .05$, indicating that factor analysis can be worthwhile for the data set. Examination of the correlation matrix of coefficients showed that the majority had greater than .3 correlation coefficients.

Applying Kaiser's criterion, components that had an eigenvalue of 1 and greater than 1 were held on for further inspections. Although the Kaiser criterion helps know the number of components to be extracted, we additionally used Scree Plot to depict the shape of the plot visually. It is shown (see Figure 1) that there was a clear break between the fourth and fifth components. In other words, components 1, 2, 3 & 4 explained much more of the variance than the rest components.

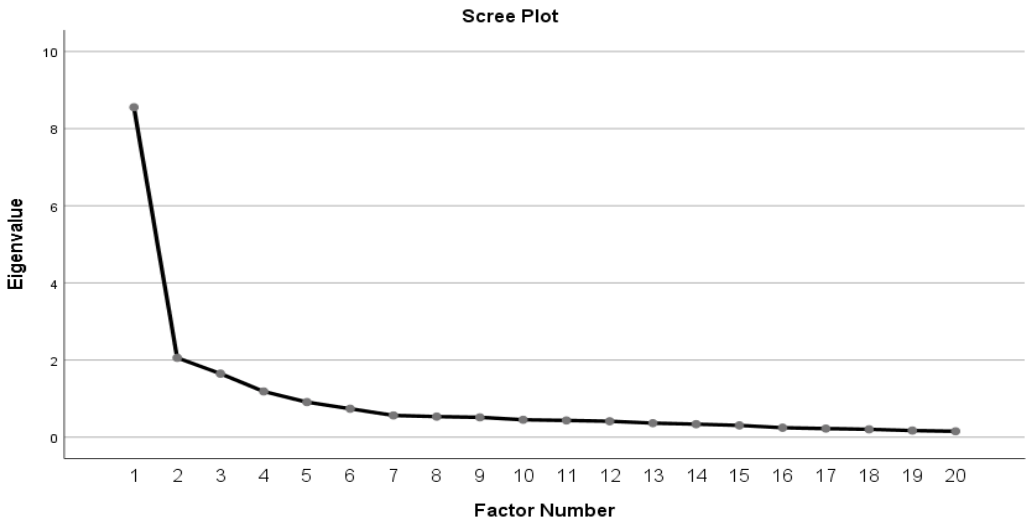
Table 2

Correlation Matrix of the CQS–AE Items

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Metacog1	-																			
2. Metacog2	.57	-																		
3. Metacog3	.49	.53	-																	
4. Metacog4	.43	.51	.51	-																
5. Cog1	.14	.28	.26	.28	-															
6. Cog2	.33	.39	.39	.36	.52	-														
7. Cog3	.33	.28	.42	.34	.36	.51	-													
8. Cog4	.30	.33	.34	.36	.36	.54	.73	-												
9. Cog5	.23	.28	.36	.42	.44	.54	.61	.74	-											
10. Cog6	.25	.24	.25	.37	.52	.52	.56	.63	.70	-										
11. Motiv1	.42	.44	.45	.27	.17	.41	.40	.40	.27	.35	-									
12. Motiv2	.45	.40	.44	.26	.13	.30	.36	.40	.28	.34	.67	-								
13. Motiv3	.49	.47	.42	.38	.06	.36	.42	.49	.33	.36	.72	.67	-							
14. Motiv4	.36	.41	.35	.31	.22	.35	.32	.32	.22	.34	.51	.58	.53	-						
15. Motiv5	.46	.48	.42	.43	.34	.46	.43	.40	.34	.49	.56	.59	.58	.69	-					
16. Bhral1	.28	.29	.35	.30	.22	.25	.45	.45	.37	.38	.39	.39	.44	.43	.47	-				
17. Bhral2	.37	.36	.40	.23	.26	.24	.34	.37	.28	.23	.41	.35	.33	.38	.39	.61	-			
18. Bhval3	.32	.33	.34	.30	.11	.28	.35	.37	.31	.22	.37	.43	.36	.42	.39	.56	.67	-		
19. Bhvral4	.26	.34	.36	.39	.23	.25	.40	.47	.38	.37	.27	.37	.39	.49	.38	.62	.58	.58	-	
20. Bhvral5	.26	.39	.36	.25	.18	.27	.39	.36	.29	.39	.44	.43	.45	.41	.40	.63	.58	.62	.60	-

Figure 1

Scree Plot Depicting Factors of the CQS–AE Items based on Eigenvalues



The EFA result showed that the first four components of CQS–AE had greater than eigenvalues 1, yielding 8.555, 2.058, 1.646 and 1.185 respectively. The four components together explained 59.172% of the variance. Components 1 and 2 explained much more of the variance than components 3 and 4. They explained 48.983% of the total variance. Conversely, components 3 and 4 explained the rest 10.189%. The oblimin rotation factors revealed all items strongly loaded on their respective components (see Table 3).

It is found that all items of cognitive CQ strongly loaded on Component 1, behavioral CQ on Component 2, motivational CQ on Component 3, and metacognitive on Component 4. There were no poorly loading items. There were no cross-loadings either. Except for a few items, all had a strong loading value of greater than .6.

Table 3

Factor Loadings of the Oblimin Rotated Four-Factor Solution of the 20 CQS–AE Items

	Factors				
	1	*2*	*3*	*4*	*Communalities*
I know the arts, crafts, music, and specific holidays of the Wolayta, Harari, Gamo, etc., cultures of Ethiopia	**.922**				.762
I know the favorite food and the feeding rules associated with in the Amhara, Somali, Hadya, Tigray and Guragie cultures in Ethiopia	**.799**				.738
I know the rules of dressing, hairstyle, and related cultural practices of the Hammer, Kambata, Afar, etc., cultures in Ethiopia	**.793**				.627
I know the cultural values, norms and religious beliefs of cultures in Ethiopia such as the Afar, Somali, Siltie, etc	**.668**				.594
I know some vocabulary (e.g., greeting words) and rules of communication of languages in Ethiopia such as Guragigna, Oromifa, Tigregna, and so on	**.563**				.500
I know the legal and economic systems of the cultures in the Northern, Southern, Eastern, Western and Central parts of Ethiopia	**.540**				.350
I use facial expressions and vocals differently to suit different cross-cultural situations		**.824**			.637
I vary the rate of my speaking (e.g., pause & silence) when a cross-cultural situation requires it		**.797**			.616
I change my nonverbal behavior when a cross-cultural situation requires it		**.752**			.605
I change my verbal behavior (e.g., accent & tone) when a cross-cultural communication requires it		**.730**			.621
I alter my facial expressions when a cross-cultural interaction requires it		**.718**			.573
I enjoy interacting with people from different cultures			**.849**		.677
I am curious to learn more and to know better about cultures that are new to me			**.845**		.715
I am confident that I can socialize with the locals in a culture unfamiliar to me			**.832**		.664

I enjoy living in cultures that are unfamiliar to me and can adjust myself to deal with the stress associated with it	**.517**		.485
I am confident that I can get accustomed to the living systems (e.g., shopping conditions) of other cultures in Ethiopia	**.490**		.573
I try to adjust my cultural knowledge when I interact with people from a culture that is unfamiliar to me		**.739**	.616
I check the accuracy of my cultural knowledge when I interact with people from different cultures		**.628**	.480
I am conscious of my cultural knowledge when interacting with people from different cultural backgrounds		**.573**	.489
I am conscious of the cultural knowledge that I apply to cross-cultural situations and/or interactions		**.557**	.487

Notes. Extraction Method: Maximum Likelihood; Rotation Method: Promax with Kaiser Normalization; Rotation converged in 5 iterations.

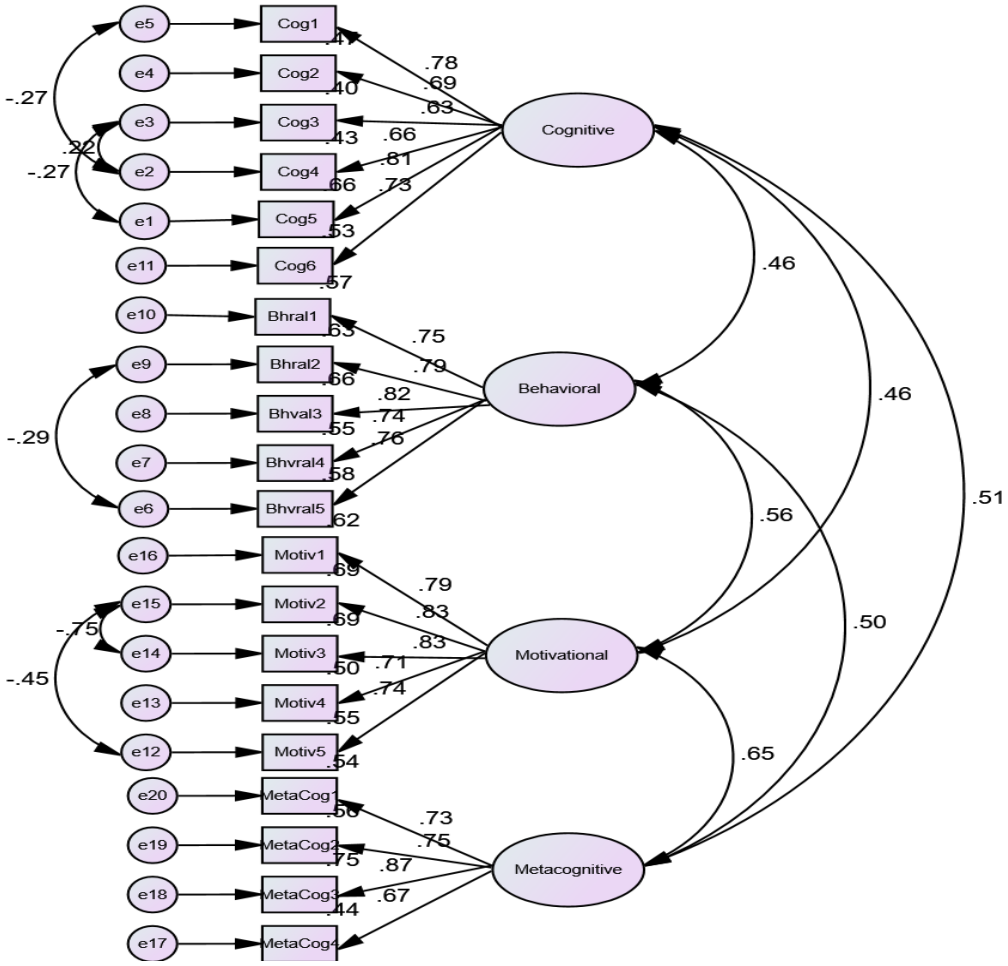
To conclude, by running a four-factor solution of the 20 items of the CQS–AE, the EFA confirmed the presence of four components with eigenvalues exceeding 1, explaining 42.774%, 10.292%, 8.232% & 5.923% of the variance on components 1, 2, 3 & 4 respectively. The Kaiser-Meyer-Olkin value was also found .894, exceeding the recommended value of .6 and reaching statistically significant (p = .000), which supported the factorability of the correlation matrix and suitability of the data for factor analysis. A significant number of coefficients were found above .3 (see Table 2). The four-factor solution in general explained a total of 59.172. % of the variance. Neither weak nor negative correlations between the four factors were observed.

Confirmatory Factor Analysis

In order to estimate and test the characteristics of the population, by employing parameters, CFA was used in this research. The correlations of observed and latent variables were found large and significant (see Figure 2). There were not many more missing data. However, for the smooth appliance of AMOS to have the CFA result, multiple imputation was used for those few cases that missed a few items.

Figure 2.

CFA Diagram of the Four-factor CQS–AE



Correlations between factors' results of the CQS–AE are also depicted in the diagram. The correlation among the CQ factors of the CFA ranged from .46 to .65. No variable was negatively related to another variable as well. In terms of the strength of relationships, the values found can be taken as medium and strong correlations ($p < .05$, n = 343).

Table 4.

Parametric Estimates and Omnibus Fit Information

Parameter	Parametric Estimates			
	Unstandardized Estimate	*Standard Error*	*Critical Ratio*	*Standardized Estimate*
Loadings				
Bhral3, Behavioral	1.01	.079	12.778	.815
Bhral2, Behavioral	.97	.086	11.212	.793
Bhral1, Behavioral	1.00			.753
Bhral4, Behavioral	.81	.073	11.077	.739
Bhral5, Behavioral	1.00			.764
Cog1, Cognitive	1.00			.775
Cog2, Cognitive	.87	.088	9.891	.685
Cog3, Cognitive	.81	.097	8.373	.632
Cog4, Cognitive	.81	.096	8.492	.659
Cog5, Cognitive	1.02	.083	12.222	.810
Cog6, Cognitive	1.00			.728
Motiv1, Motivational	1.00			.786
Motiv2, Motivational	1.20	.104	11.466	.831
Motiv3, Motivational	1.01	.079	12.860	.828
Motiv4, Motivational	1.10	.099	11.047	.709
Motiv5, Motivational	1.00			.741
Metacog1, Metacognitive	1.00			.732
Metacog2, Metacognitive	.96	.092	10.449	.747
Metacog3, Metacognitive	1.28	.104	12.306	.866
Metacog4, Metacognitive	1.00			.667

Note. Estimates are significant ($p<0.05$)

Table 4 comprises the observed covariance matrix. The general matrix comprised a total of 76 parameters (40 regression weights, 24 variances, 12 covariances). However, all identified parameters are not listed here. All the items had strong regression weight (above .5). Estimate of the regression weight of the third item of the behavioral factor, for example, was .815, indicating the highest beta value under the particular factor. The unstandardized estimates are also depicted. For example, the particular item (i.e., Bhral3) had a standard error of .079. This means that when the behavioral construct goes up by 1, this specific item (Bhral3) goes up by 1.006.

Table 5.

Model Fit Indices and Modification Fit

	Omnibus Fit Indices				
Model	x^2	*df*	*p*	*CFI*	*RMSEA*
Four-factor Original model	350.185	168	.000	.898	.079 (p<.05)
Covary of e1 & e3, e2 & e3, e2 & e5, e6 & e9, e12 & e15, e14 & e15	272.304	162	.000	.938	.063 (p>.05)

CFA of the four CQ factors demonstrated a nearly acceptable model fit (χ^2 162*df*) = 272.30, NFI = .863, CFI = .938, PCFI = .800, and RMSEA = .063 (p > 0.05). The standardized factor loadings of the items ranging from 0.632 to 0.866 were significantly different from zero, and the reliability coefficients for the four factors were 0.80 to 0.87. As Table 5 presents, the original four-factor model of the CQS was not directly fit to the current original data. However, after the covariance of error terms was progressively done, based on modification indices values, improvements in the model fit indices were shown.

Constructs Reliability and Validity

To test the extent to which the measure is reliable and can yield consistent results, an internal consistency reliability test of the CQS–AE was carried out first in this validation study. The Cronbach's alpha coefficients for the CQS–AE factors were found to range from .80 to .87. Metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ subscales of the CQS–AE were found with Cronbach's alpha coefficients of .80, .84, .87 and .87 respectively. The overall CQS–AE reached Cronbach's alpha coefficient of .92. In addition to internal consistency

reliability, Composite Reliability (CR) was calculated to know further about the factors' reliability. Consequently, CR all constructs was found above .8 (see Table 6).

To know if all items of the respective constructs are measuring the same thing intended to measure, convergent validity was assessed by calculating Average Variance Extracted (AVE). AVE for all constructs were above .50. Analyses of AVEs were also used to investigate discriminant validity. AVEs for each CQ factor (0.5 – 0.61) exceeded the square of the correlations with other CQ factors (0.21 – 0.42), which showed the constructs are distinct (see Table 6).

Table 6

Reliability and Validity of the Adapted Cultural Intelligence Scale (CQS– AE)

Variable	Reliability		Validity	*No. of Items*
	Cronbach's Alpha	*CR*	*AVE*	
Metacognitive CQ	.81	.84	.57	4
Cognitive CQ	.87	.86	.52	6
Motivational CQ	.88	.89	.61	5
Behavioral CQ	.88	.88	.60	5
Overall CQS– AE	.92			20

Depending on the nature and purpose of a scale, different levels of reliability values are required and are suggested by scholars. In this regard, the CQS–AE yielded more than the cut-off values, demonstrating very good reliability on a youth sample of Ethiopian public university students. Values above .7 are considered acceptable but values above .8 are preferable [8].

In the reliability analysis, the degree of correlation between each item with the overall item of the CQS–AE was also examined to identify the items that had a low correlation with the total score. It was found that all the values were positive. A positive value is that the items are measuring the same underlying construct attribute.

Discussion

Studies showed the validity of the construct and the factor structure of the CQS following the foundational validation study by Van Dyne et al. [23]. In a study conducted to know the

reliability, factorial validity, and discriminant validity of the CQS and its subscales on a sample of university students in Serbia, the discriminant validity of the scale and its four subscales were verified by testing the relationship with measures of social and emotional intelligence (Social Skills Inventory), personality (Big Five), and self-assessment of intercultural experience [19]. The study also revealed that there is a four-factor structure of the CQS.

The Persian version of CQS was tested on 854 undergraduate and graduate students from three different universities in Iran. The result showed that CQS is a four-factor structure [10]. A study also supported the construct, convergent, and criterion-related validities of the Portuguese SFCQ scale on a sample of international students [13].

The result of the CQS–AE is, therefore, consistent with previous studies on the construct, confirming it is a four-factor structure.

Ethiopia is a country with a diversified population in terms of ethnicity, culture and religion. The interplay among people is considered essential for existence by the larger society in Ethiopia. University students' societal and cultural values, in this regard, cannot be significantly different from the general society. Therefore, the CQS–AE will be a helpful instrument for the investigation of CQ for future researchers about youth students at university levels so that it is possible to design intervention strategies if needed.

Afterwards, an item of the cognitive subdimension, which reads as "I know the legal and economic systems of the cultures in the Northern, Southern, Eastern, Western and Central parts of Ethiopia" tended to show low correlation coefficients (communalities = .350) with the majority of items of the CQS–AE. Nonetheless, other analysis results of the reliability examination such as items-total statistics did not yield analogous values on the particular item to remove. Neither the EFA nor the CFA results did show poor loading values of the item as well. Consequently, future researchers in the area need to notice this fact regarding the particular item.

Limitations and further recommendations

The study employed both EFA and CFA by splitting the total data (n = 343) into two halves. Although cases of about 150 are acceptable, many scholars suggest conducting factor analyses, especially CFA, on a sample of greater than 200 cases. So, this could be taken as a limitation of the current study. This limitation arises from the delimitation of the study for methodological

reasons. We, thus, recommend for future research on CQS–AE to run CFA on a larger sample to test the hypothesized measurement model.

Conclusion

The adaptation and validation of the psychometric properties of the 20 items CQS found sound quality and congruence. As CFA is a more stringent multivariate analysis, however, direct model fitness was not initially obtained. Covariances of error terms (i.e., e1 & e3, e2 & e3, e2 & e5, e6 & e9, e12 & e15, e14 & e15) resulted in relatively acceptable model fit. This means, there were overlaps between those unobserved factors (i.e., between items 5 & 3, items 4 & 1, and items 2 & 3 of the cognitive factor; items 5 & 2 of the behavioral factor; items 3 & 2 and 5 & 2 of the motivational factor). Some hypothetical accounts regarding the items and the population can also be made. However, cross–validation of these items in a different data set would be important for future studies in the area.

Covariances of the factors were found medium and large; the correlation between metacognitive and cognitive (r = .51), cognitive CQ and motivational CQ (r = .46), cognitive CQ and behavioral CQ (r = .46), metacognitive CQ and motivational CQ (r = .65), metacognitive CQ and behavioral CQ (r = .50) motivational CQ and behavioral CQ (r = .56). All correlations were significant ($p < .05$). Examination of the internal consistency reliability test resulted in very good at the factor level and excellent at the overall construct level.

The factor structure was found consistent with prior research results [1, 2, 9, 14, 23]. The correlations between the four components were found from medium to strong. In general, the result of the present study showed that the CQS in Ethiopian Amharic translation (CQS–AE) was adequately validated and can be interpreted in the same way as versions in other languages.

Compliance with Ethical Standards

Before processing the result of the study for publication, we officially obtained permission from the copyright holders of the CQS. The principle of informed consent was essentially followed, respected and obtained from all the participants, as per the ethical standards aligned with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards

such as APA. Furthermore, we received an ethical clearance letter from the Research Ethics Committee of the School of Psychology.

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