

Validation of the Cultural Intelligence Self-Assessment Scale in the context of DR Congo-Kinshasa

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ABSTRACT

The purpose of this study was to validate a Cultural Intelligence (CQ) Self-Assessment Scale in DR Congo. The questionnaire was self-administered to 430 workers in enterprises from both the public and private sector, as well as representing all linguistic groups. When the Principal Component Analysis and orthogonal varimax rotation extraction method were employed to group items in the data set, five factors were extracted but two were removed for poor internal consistency at the exploratory stage. The three factors retained were renamed regarding the considered CQ aspects, and estimation of their individual assessment scales at confirmatory factor level led to the deletion of four more items. The final CQ Self-Assessment model fitted well with the data after the errors' correlation technique was applied to modify the initial model that showed poor fitting statistics. The contextualised CQ Self-Assessment Scale will be an asset in determining workers' level of CQ and its related aspects in DR Congo. Future research should replicate this study beyond Kinshasa Province and address its limitation by integrating the Meta-cognitive component that was not considered.

Keywords: cultural behaviours/skills, cultural intelligence, cultural understanding, constant awareness, factor analysis, Kinshasa

A. INTRODUCTION

Diversities observed for decades at the workplace necessitate enhancing workers with skills that promote intercultural relationships at work (DuBrin, 2014). Indeed, according to Earley and Mosakowski (2004), three sources - "Head", "Body" and "Heart" - make up Cultural Intelligence (CQ) and need to work together in order for individuals that might be socially intelligent in their own settings to remain as effective in culturally novel ones. Although the concept of CQ has often been associated with the global cultural environment, it is also true that cultural differences express themselves at multiple levels of culture, including the national and regional ones (Yates and De Oliveira, (2016), as well as in a variety of cultural contexts, such as ethnic, generational and organisational cultures (Livermore, 2011, p. 5). Hence, the importance of investigating and discussing CQ in the context of DR Congo where allegations of leadership mismanagement with regards to national cultural facets of workers

has fuelled tensions beyond the workplace (Nkashama, 2015). However, given the lack of research related to CQ in the context of DR Congo, it was important to validate a Cultural Intelligence Self-Assessment scale, in order, structurally, to understand the relationships between CQ's aspects that are cultural awareness (CAW), cultural understanding (CU) and cultural behaviours or skills (CQS) using a confirmatory factor analysis (CFA) approach, but also, realistically, to be able to determine Congolese workers' level of CQ and related aspects.

The main issue in this study consisted of determining whether it worth using the widely employed CQ scale proposed by Bucher and Bucher (2008) in the context of the DR Congo to assess and understand workers' CQ levels. As this research kind is the first conducted in its context, the present study contributes greatly to the spreading of the CQ knowledge in DR Congo and the development of science on the subject in the field of business management through empirical discovery. In other words, it adds a brick to the wall of CQ knowledge.

B. LITERATURE REVIEW

The term CQ was first coined in 2002 and attracted the attention of academicians and professionals beyond its naturally connected business management discipline to date (Klafke, Picinin, & Townsend, 2019). The CQ topic is barely known in many regions of the world and, in addition to being unaware of it, people have confused it with two other psychological concepts that are emotional (EQ) and social intelligence (SQ) (Klafke, Picinin, & Townsend, 2019). In order to enlighten the audience with regards to the aforementioned concepts, the present study will briefly present them while placing emphasis on CQ which is its focus topic. EQ and SQ are two closely linked concepts that were respectively highlighted by Goleman (1998) and Thorndike (1920), the first coming into existence in the 1990s while the second hatched in the early twentieth century. Debate on the essence of both concepts has pathways to what is called "multiple intelligences" introduced by Gardner, who claims that the word 'emotional' refers to something intrapersonal in the context of intelligence, while 'social' is a synonym of interpersonal (Cherry, 2019). Therefore, pairs such as Salovey and Mayer who agreed with him asserted that Gardner's newly developed concept is a combination of EQ and SQ (Klafke, Picinin, & Townsend, 2019). According to Serrat (2017), "EQ describes the ability, capacity, skill or self-perceived ability to identify, assess and manage the emotions of oneself, of others, and of groups." On the other hand, SQ seen as a cognitive component of individuals' communicative competence (Yermentayeva, (2016), is defined as "the development by his knowledge, skills and abilities to understand himself/herself, self-

behaviour, actions of other people and to build effective interaction and also to achieve a goal” (Karl, 2005, p. 304). It is worth acknowledging that both EQ and SQ have a strong cognitive aspect (Klafke, Picinin, & Townsend, 2019).

This topic of this study, CQ, is the acquired capabilities, skills and understanding to function effectively and to engage successfully in multi-cultural business and social environments through accommodation of the incidence of the cultural background behaviours that the workers might have (Khodadady & Ghahari, 2011). Thus, it acknowledges the reality of globalisation in the reasoning process to solve problems in the workplace (Earley and Ang, (2003), while drawing also from Gardner’s multiple intelligences to help workers cope and behave effectively in a situation characterised by cultural diversity (Gardner, 1993). As such, CQ provides workers with the necessary cultural sensitivity that helps them to interpret their colleagues’ ambiguous and unfamiliar behaviours that people belonging to the same culture with them would (DuBrin, 2014, p. 177). Although Earley and Ang (2003) were the pioneers who introduced CQ, the necessity of applying it for effective business relationships in a culturally diversified workplace was emphasised by Earley and Mosakowski (2004). Since then, CQ has gained interest in both academic and professional areas and is deemed the “essential business intelligence to succeed in the 21st Century” by Livermore and Van Dyne (2015). Generally, instruments assessing CQ measure four components, as conceptualised by Earley and Ang (2003), which are: Meta-cognitive CQ, Cognitive CQ, Motivational CQ and Behavioural CQ.

Meta-cognitive CQ is a process of acquiring knowledge and understanding of other people’s cultures. This process consists of consistently balancing one’s own thoughts versus those of others, which leads to checking cultural assumptions and adjusting them accordingly in a multicultural environment (Brislin, Worthley, & MacNab, 2006). As for Cognitive CQ, it refers to the acquired knowledge and understanding of differences and similarities between one culture and another (Solomon & Steyn, 2017). Cognitive CQ focuses on knowledge acquired through personal experience and education in relation with economic and legal systems, social norms, religious beliefs, practices and conventions across cultures (Triandis, 2006).

Motivational CQ determines an individual’s ability and motivation to learn about new cultures and adjust his behaviour in cross-cultural environments (Guðmundsdóttir, 2015). It requires interest from an individual to experiment with other cultures and interact with culturally diverse people - hence, highly motivated individuals are confident of functioning effectively within cross-cultural environments. However, Behavioural CQ refers to an

individual's capability to exhibit appropriate verbal and nonverbal behaviour during interaction with people from different cultures (Khodadady & Ghahari, 2011). It requires an individual to possess a wide repertoire of behavioural responses that can accommodate a variety of cross-cultural situations, and an aptitude to adapt both verbal and nonverbal behaviour by avoiding the use of words, tone, gestures, and facial expressions that are inappropriate in different cultures.

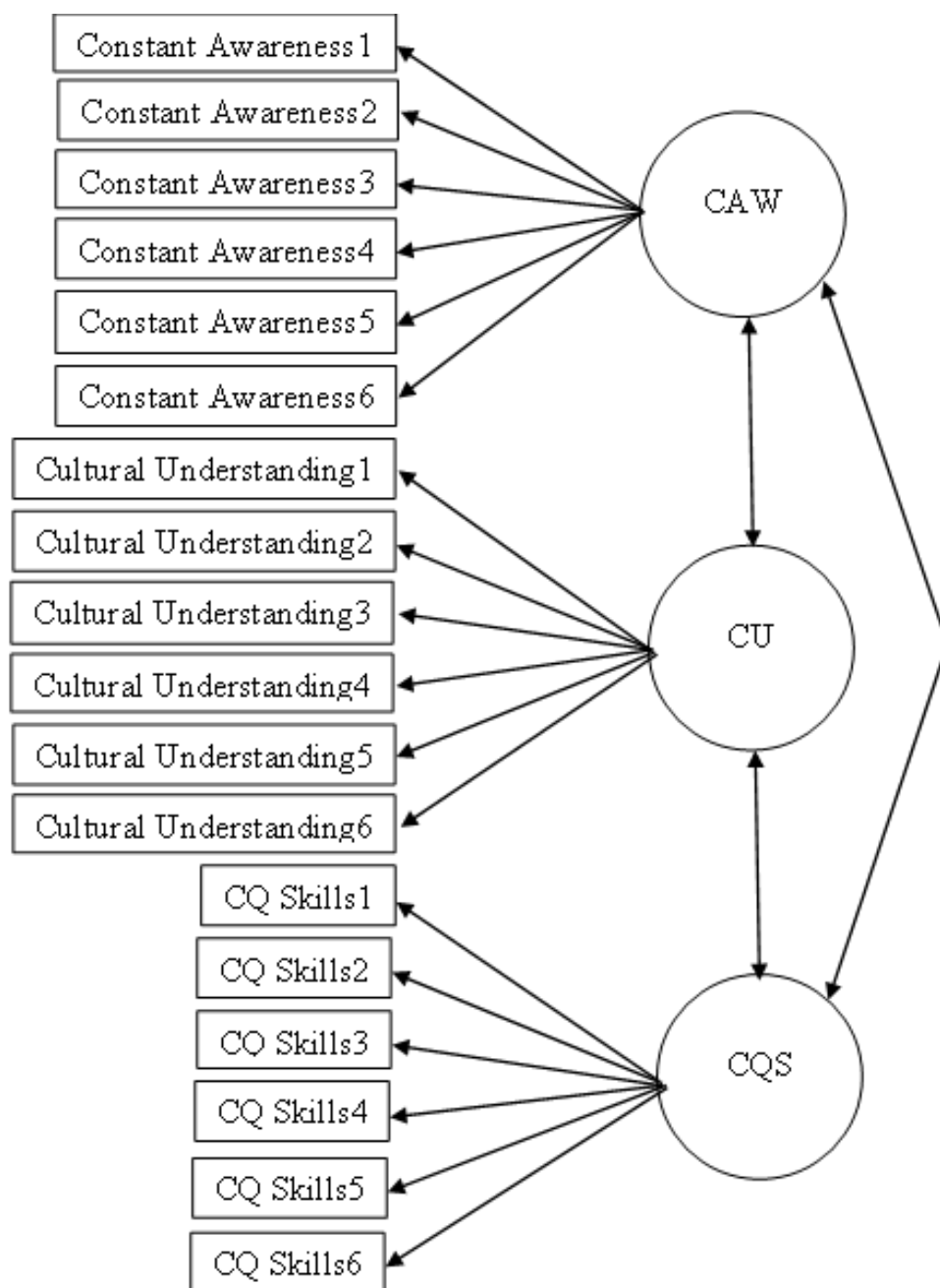


Figure 1: Cultural Intelligence Self-Assessment Scale: Analytic Approach

The instrument of this study, however, considered only three components and is a self-assessment scale proposed by Bucher and Bucher (2008). The components it uses are called constant awareness (CAW) which refers to Meta-cognitive CQ, cultural understanding (CU) which relates to cognitive CQ and CQ Skills (CQS) which indicate behavioural CQ. Each component is measured through six items that use a five-points Likert scale, ranging from never to most of the time. In addition, the researcher also captured biographic data including gender, age, level of education, marital status, place of living, workplace, and linguistic group.

As noted in the introduction, the aim of this study was to see if the items could best fit the data to support their inclusion in measuring each aspect of CQ in the context of DR Congo, using CFA as well as investigating the relationships between CQ's aspects. The analytic approach adopted is presented in Figure 1.

C. RESEARCH METHOD

Participants (Bio data)

This study approached 430 Congolese workers who volunteered to participate as demonstrated in Table 1, of whom 245 (57.0%) were males and 185 (43.0%) females. Their ages ranged between 20 and 62 (Mean = 37.57; SD = 11.40). They had different levels of education which were grouped under eight categories of Some Primary Schooling (n = 5, 1.2%), Standard 6/Grade 8 (n = 15, 3.5%), Standard 9/Grade 10 (n = 9, 2.1%), Matric (n = 34, 7.9%), Undergraduate degree (n = 97, 22.6%), Bachelor degree (n = 220, 51.2%), Master's degree (n = 47, 10.9) and Doctoral degree (n = 3, .7%). 168 (39.1%) participants were single, 201 (46.7%) were married while 21 (4.9%) were living together without legal ties, 5 (1.2%) were divorced while 7 (1.6%) were separated and 28 (6.5%) were widow[er]. Most respondents (n = 190, 44.2%) lived in Lukunga district, 116 (27.0%) lived in Mont Amba district and 88 (20.5%) lived in Funa district, while the minority 36 (8.4%) consisted of Tshangu district inhabitants. The study sample was composed, in the majority, of workers from the public sector (n = 240, 55.8%), while the minority (n = 190, 44.2%) worked in private-owned enterprises. Expats constituted the minor linguistic group represented, while the major one (n = 185, 43.0%) was Kikongo, followed by Tshiluba (n = 134, 31.2%), Swahili (n = 68, 15.8%) and Lingala (n = 40, 9.3%).

Sampling procedure and Data collection

The study did not follow an assisted-administration approach of the questionnaire, given that the instrument used was a self-assessment one measuring three CQ components that are

Table 1: The Demographic Profile of the Participants (n = 430)

Bio-characteristics	Frequency	Percent
<i>Gender</i>		
Male	245	57.0
Female	185	43.0
Total	430	100.0
<i>Age</i>		
18 – 30 yrs Old	166	38.6
31 – 40 yrs Old	113	26.3
41 – 50 yrs Old	74	17.2
51 – 60 yrs Old	66	15.3
61 – Older	11	2.6
Total	430	100.0
<i>Level of education</i>		
Some primary schooling	5	1.2
Standard 6/Grade 8	15	3.5
Standard 8/Grade 10	9	2.1
Matric	34	7.9
Undergraduate degree	97	22.6
Bachelor degree	220	51.2
Master degree	47	10.9
Doctorate degree	3	0.7
Total	430	100.0
<i>Marital status</i>		
Single	168	39.1
Married	201	46.7
LivePartner	21	4.9
Divorced	5	1.2
Separated	7	1.6
Widow[er]	28	6.5
Total	430	100.0
<i>District of residence</i>		
Funa	88	20.5
Lukunga	190	44.2
Mont-Amba	116	27.0
Tshangu	36	8.4
Total	430	100.0
<i>Sector of industry</i>		
Public	240	55.8
Private	190	44.2
Total	430	100.0
<i>Language group</i>		
Kikongo	185	43.0
Lingala	40	9.3
Swahili	68	15.8
Tshiluba	134	31.2
Other	3	0.7
Total	430	100.0

CAW, CU, and CQS. Also, the Covid 19 pandemic that challenged all aspects of human activities recommended that contact should be avoided if not necessary to the research, there should be at least 1-metre social distancing, 70% alcohol hand sanitiser should be applied regularly, and the wearing of a face mask that fully covers the mouth and nose should be mandatory. Hence, trained research assistants were used to distributing questionnaires randomly to workers at their place of work without assisting them in completing the questionnaire. Contact details such as cell phone, email address, Facebook, Messenger, Twitter, and WhatsApp were provided to answer questions and give clarification about the study's objective and meaning of items to any worker who received the questionnaire.

Participants who had consented to answer the study questionnaire were invited to complete it anonymously, and confidentiality regarding their responses was guaranteed. After a week, research assistants returned to collect the completed questionnaires. A total of 550 questionnaires were distributed in both public (330) and private (220) sector enterprises. The study recorded 78.2% response rate, 72.7% from public workers and 86.4% from workers in private enterprise. The criteria of eligibility included being a worker within a legally established enterprise, and aged eighteen years and above. The present study used a stratified-quota random sampling method to retain 430 respondents. It should be noted there are no statistics available that provide the population of workers, neither countrywide nor in Kinshasa Province.

The sampling procedures consisted of creating two pools containing the names of the enterprises, one for the public one and another for the private one. Then, a draw was organised to select 12 enterprises from the public sector pool and 8 from the private sector one. However, the researcher tried to determine selected enterprises' sample sizes regarding their sector of activities to reflect on their respective population distribution's weight to obtain a realistic representative distribution of the workers' population. Although data are missing, it is acknowledged that the public sector employs the greater number of workers, hence a quota of 60% was allocated to public enterprises and the remaining 40% to private ones.

D. RESULTS AND DISCUSSION

The first step consisted in performing an exploratory factor analysis (EFA) and reliability tests using the software program SPSS Version 26. This was to discover the factor structure of the data collected from the research ground by means of participants' response to the CQ Self-Assessment scale that explains the specified underlying dimensions of each CQ aspects

considered in the present study, and to examine its internal reliability (Ayikwa, De Jager, & Van Zyl, 2019).

The applied factor analysis (FA) explored the underlying theoretical structure of workers' CQ by grouping items in data set (factor) based on strong correlations through the use of principal component analysis (PCA) and orthogonal varimax rotation extraction method (Tabachnick & Fidell, 2019). Data suitability to proceed with FA and the sample adequacy were determined through Kaiser-Meyer-Olkin (KMO), and Bartlett's Test for Sphericity and Determinant. The KMO coefficient of 0.7 well above the acceptable level of 0.5 suggested that data were sufficient for EFA. The Bartlett's Test for Sphericity $X^2(153) = 1458.23$ was significant at $p < 0.000$, showing that there were patterned relationships between items while a correlation matrix determinant of 0.03 demonstrated the absence of collinearity. Hence, the evidence that the study's sample size (430) was appropriate for carrying out EFA.

Table 2: Validity and Reliability Analysis Using Exploratory Factor Analysis (EFA) and Cronbach Alpha.

Dimension	Items	Factor loading	Cronbach's Alpha	Factor Renaming
Factor 1	Constant awareness3	0.712	0.754	CU
	Constant awareness6	0.628		
	Cultural understanding4	0.626		
	Cultural understanding5	0.625		
	Cultural understanding6	0.556		
	CQ skills2	0.554		
	CQ skills6	0.538		
Factor 2	CQ skills1	0.797	0.544	CQS
	CQ skills4	0.749		
	CQ skills5	0.417		
Factor 3	Constant awareness4	0.809	0.506	CAW
	Constant awareness5	0.693		
	Cultural understanding1	0.433		
Factor 4	CQ skills3	0.686	0.377	-
	Cultural understanding2	0.596		
	Cultural understanding3	0.462		
Factor 5	Constant awareness1	0.769	0.362	-
	Constant awareness2	0.388		

The eighteen items were loaded into five underlying dimensions (factors), as illustrated in Table 1. No item was disregarded or considered for deletion at this stage as they all loaded above the 0.3 threshold into their respective factor (Hair, Black, Babin, & Anderson, 2010).

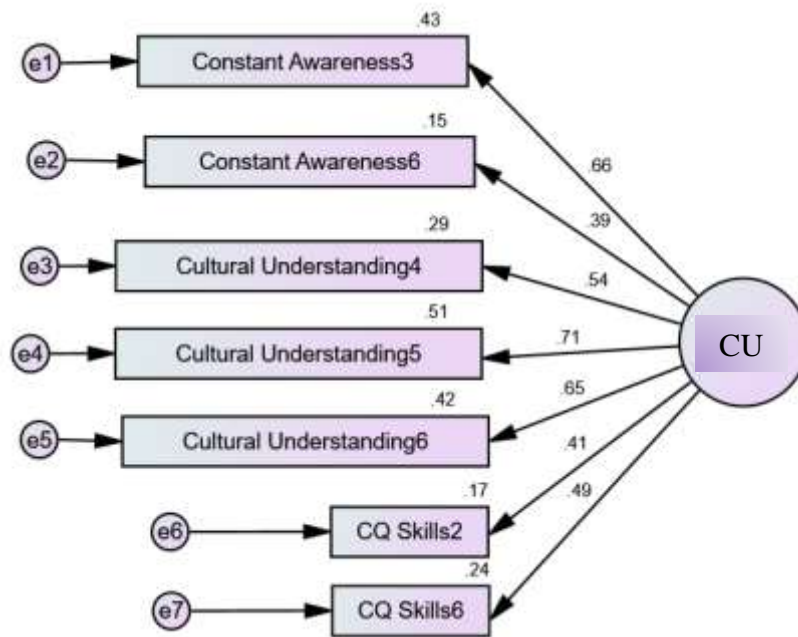
Then, after Cronbach’s Alpha was conducted to test reliability within each factor, two of them (Factor 4 & Factor 5) were considered for deletion for having Alpha coefficients (0.38 & 0.36) below the 0.5 acceptable level, as indicated in Table 2 (Nunnally & Bernstein, 2010).

Following the EFA that demonstrated convergent validity and reliability of the study’s CQ self-assessment scale, items have been reorganised regarding their new underlying components (see Table 1). CQ was best explained by three components that were labelled according to the three CQ aspects considered in this study. Each newly restructured dimension’s scale was tested for divergent validity and reliability through average variance extracted (AVE) and composite reliability (CR) tests at confirmatory level before their integration for testing adequacy of CQ Self-Assessment measurement model by means of the Maximum likelihood (ML) estimation method using Amos software tools version 23.

The items that loaded below the 0.4 threshold were removed, while the cut-offs often used for AVE and CR are respectively set at ≥ 0.5 and ≥ 0.6 (Hair, Black, Babin, & Anderson, 2010), but lesser values are acceptable for AVE to proceed with the overall model fit test if offending estimate does not occur (Huang, 2007) as well as a CR value ≥ 0.5 (Nunnally & Bernstein, 2010). Offending estimate is manifested by negative error covariance and/or standardized regression coefficient ≥ 1 (Shyu, Li, & Tang, 2013). Thus, the item cultural understanding1 was dropped from CAW dimension and CQ skills1 could not make it for CQS dimension, while constant awareness 6 and CQ skills 2 were the items left aside for CU dimension, as illustrated in Figures 2-8 alongside the fit statistic indices. The cut-offs for good fit for each measure are presented in Table 3.

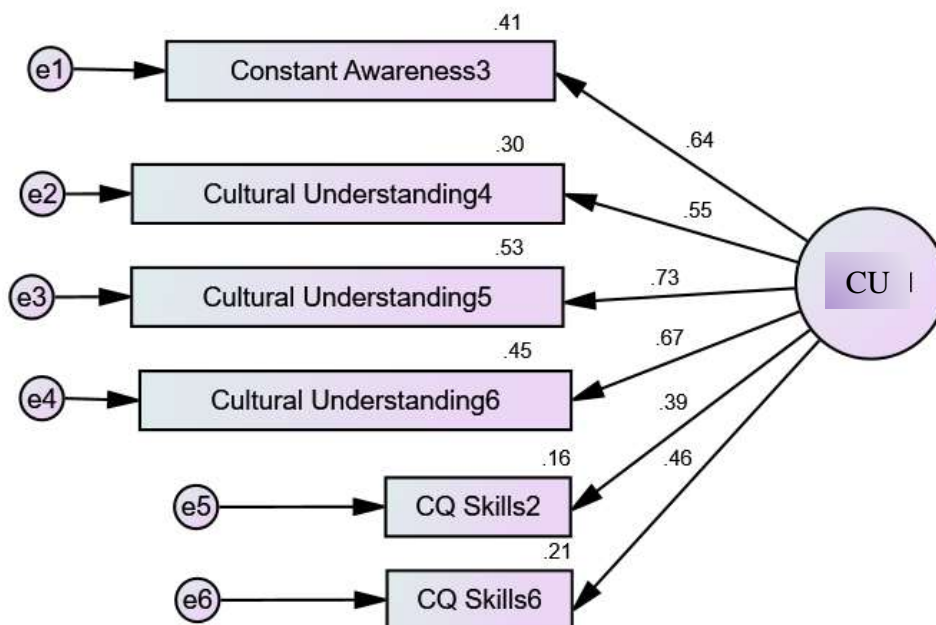
Table 3: Reported Fit Statistics for CFA

Measure	Name	Cut-off for good fit
CMIN/DF	Chi square/Degree of freedom	≤ 5.0 to 2.0
NFI	Bentler-Bonett normed fit index	≥ 0.9 to 1
RFI	Relative fit index	> 0.9
TLI	Non-normed fit index	> 0.9 (sometimes > 0.8)
CFI	Comparative fit index	≥ 0.9 to 1
RMSEA	Root-mean-square error of approximation	≤ 0.08
SRMR	Standardised root-mean-square residual	≤ 0.08



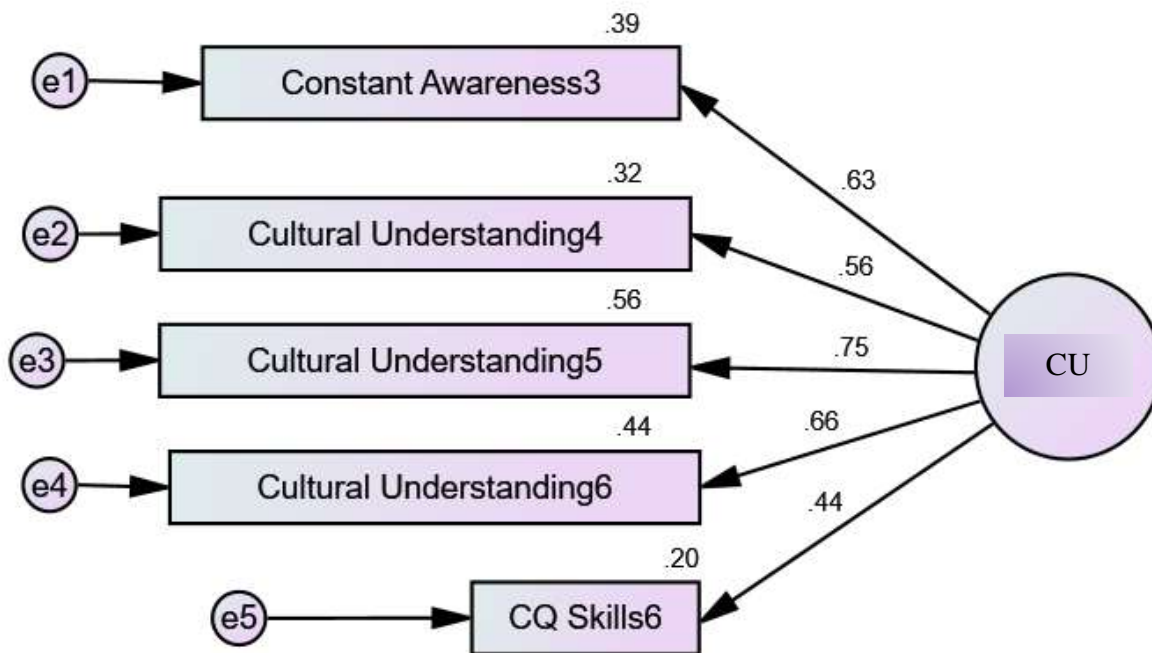
CMIN = 52.093; DF = 14; CMIN/DF = 3.721; $p = 0.00$; GFI = 0.96; RFI = 0.89;
CFI = 0.93; TLI = 0.90; RMSEA = 0.08; SRMR = 0.05; AVE = 0.32; CR = 0.76

Figure 2: CU Measurement Model 1



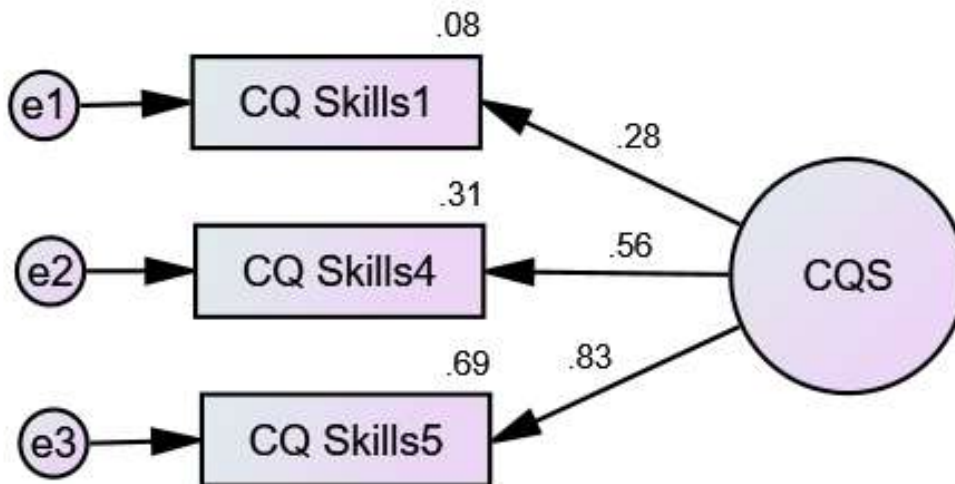
CMIN = 29.194; DF = 9; CMIN/DF = 3.244; $p = 0.00$; GFI = 0.98; RFI = 0.91; CFI = 0.96;
TLI = 0.93; RMSEA = 0.07; SRMR = 0.04; AVE = 0.34; CR = 0.75

Figure 3: CU Measurement Model 2



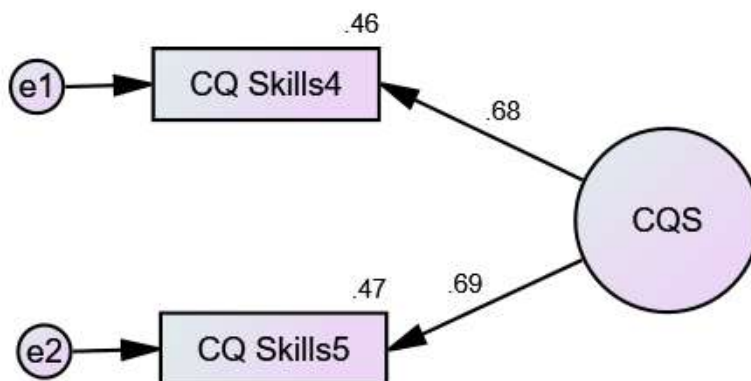
CMIN = 6.047; DF = 5; CMIN/DF = 1.209; $p = 0.03$; GFI = 0.99; RFI = 0.97; CFI = 0.99; TLI = 1.00; RMSEA = 0.02; SRMR = 0.02; AVE = 0.38; CR = 0.75

Figure 4: CU Measurement Model 3



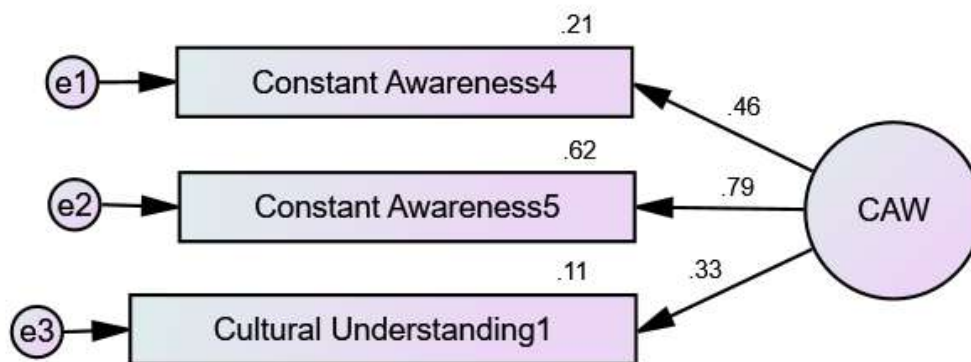
CMIN = .000; DF = 0; CMIN/DF = -; $p = -$; GFI = 1.00; RFI = -; CFI = 1.00; TLI = -; RMSEA = -; SRMR = 0.00; AVE = 0.36; CR = 0.59

Figure 5: CQS Measurement Model 1



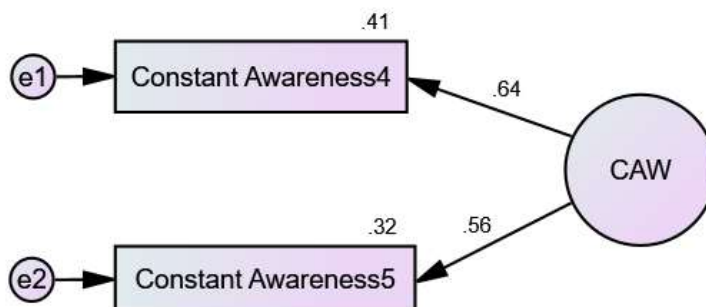
CMIN = .000; DF = 0; CMIN/DF = -; p = -; GFI = 1.00; RFI = -; CFI = 1.00; TLI = -; RMSEA = -; SRMR = 0.00; AVE = 0.47; CR = 0.64

Figure 6: CQS Measurement Model 2



CMIN = .000; DF = 0; CMIN/DF = -; p = -; GFI = 1.00; RFI = -; CFI = 1.00; TLI = -; RMSEA = -; SRMR = 0.00; AVE = .31; CR = 0.55

Figure 7: CAW Measurement Model 1



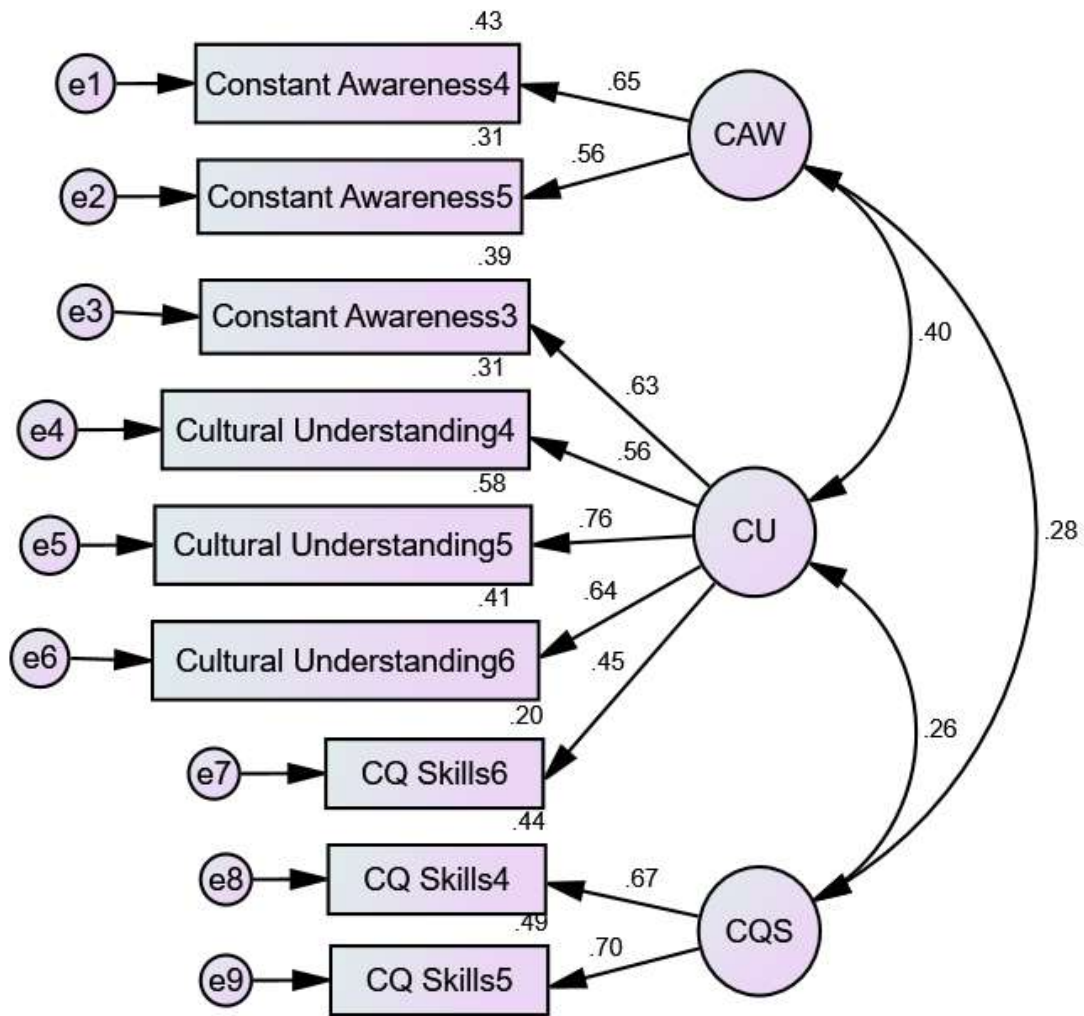
CMIN = .000; DF = 0; CMIN/DF = -; p = -; GFI = 1.00; RFI = -; CFI = 1.00; TLI = -; RMSEA = -; SRMR = 0.00; AVE = 0.36; CR = 0.53

Figure 8: CAW Measurement Model 2

Individual assessment of each CQ aspect's dimension demonstrated that the initial CU measurement model displayed an overall good fit, despite RFI (0.89) being below its permissible 0.9 level and item constant awareness 6 (0.39) loading below the 0.4 threshold. As a result, constant awareness 6 was removed and the new estimated CU measurement scale suggested a good fitting model in term of fitting indexes, while item CQ skills 2 did not meet the required loading threshold. Hence, CQ skills 2 was deleted, and the final CU measurement model fitted well to the data. Estimation of the initial CQS measurement model showed a perfect fit, but item CQ skills 1 did not meet the factor loading criteria. Therefore, CQ skills1 was removed and the final CQS measurement model satisfied all the criteria. Lastly, estimation of the initial CAW measurement model demonstrated a perfect fit, despite item cultural understanding1 loading below the recommended threshold. Thus, cultural understanding1 was deleted and the estimation of the final CAW measurement scale indicated a good fitting model that met all criteria.

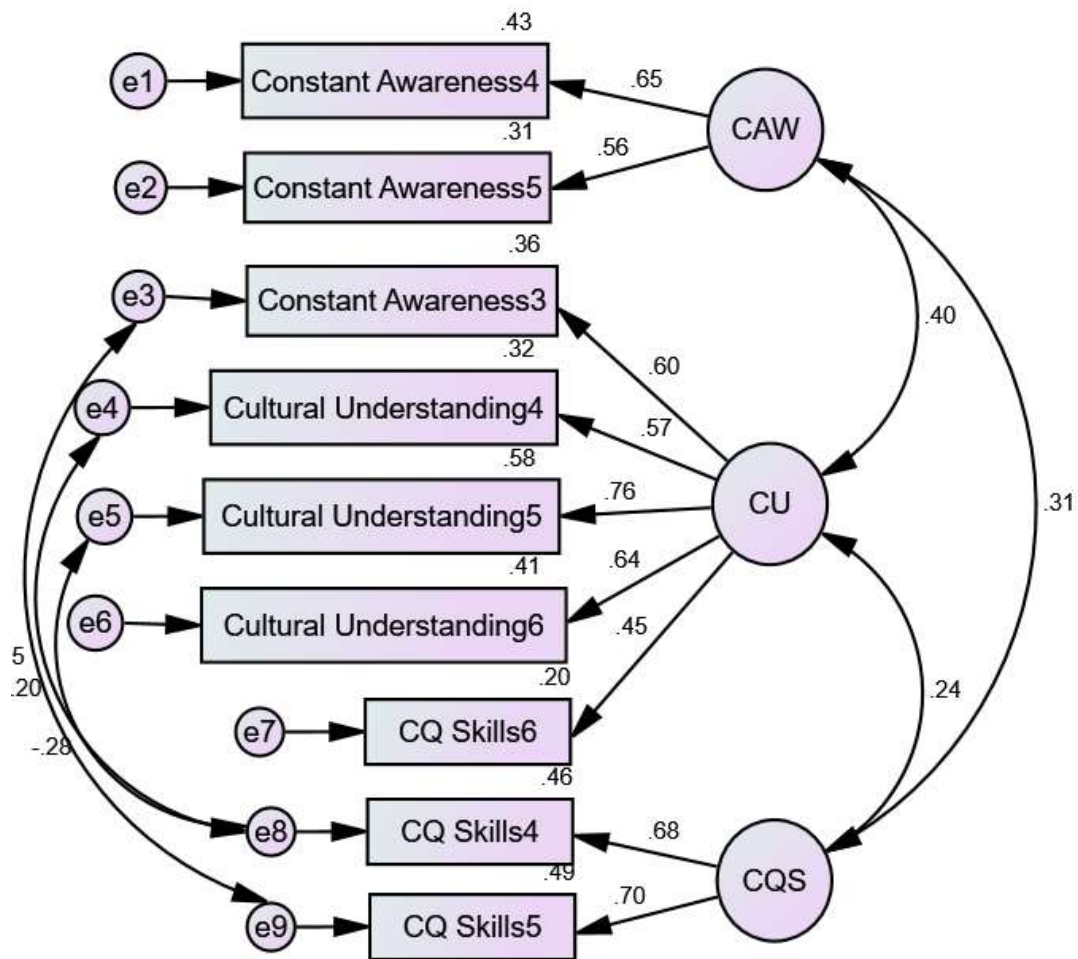
The initial estimation of CQ-related dimensions suggested a poor fitting model with the indices CMIN/DF (5.26) and RMSEA (0.10) being above their permissible level, while RFI (0.76), CFI (0.85) and TLI (0.80) scored below their required cut-off for good fit, as illustrated in Figure 9. Thus, the modification indices result was scrutinised to identify some measurement errors' correlation that enabled good fitting statistics to be achieved. As illustrated in Figure 10, the errors' estimates e3, e4, e5, e8 and e9 were correlated in the following way: e3↔e9, e4↔e8 and e5↔e8. Although this practice has raised concern among peers within the scientific community who fear omission of relevant variables (Hermida, 2015), it is justifiable in this study as it is driven by theory rather than the empirical purposes to fit the data. Indeed, it can be assumed that the variables involved are narrowly linked from the common sense of respondents' understanding - hence, their errors share some variance. All the paths shown in the final model are significant, as critical ratios were above 1.96.

In term of aspects of CQ relationships, results indicate that CAW correlate significantly and positively with CQS ($r = 0.3$), medium size effect. Likewise, CAW correlate significantly and positively with CU ($r = 0.4$), medium size effect. However, though CU and CQS correlate significantly and positively with CQS ($r = 0.2$), its size effect is small. All correlations are significant at $p \leq 0.01$ (see figure 9 and 10).



CMIN = 136.801; DF = 26; CMIN/DF = 5.262; p = 0.00; GFI = 0.94; RFI = 0.76; CFI = 0.85; TLI = 0.80; RMSEA = 0.10; SRMR = 0.07; AVE = 0.40; CR = 0.85

Figure 9: CQ Self-Assessment Measurement Model 1



CMIN = 90.569; DF = 23; CMIN/DF = 3.938; $p = 0.00$; GFI = 0.96; RFI = 0.82; CFI = 0.91; TLI = 0.86; RMSEA = 0.08; SRMR = 0.07; AVE = 0.40; CR = 0.85

Figure 10: CQ Self-Assessment Measurement Model 2

E. CONCLUSION

The study's CQ self-assessment scale was verified through FA in the context of DR Congo. The first step consisted in conducting EFA to reduce and identify the underlying dimensions of CQ that best explained each CQ aspect. Convergent validity and reliability were assessed through strong correlations, using PCA and orthogonal varimax rotation extraction method, and Cronbach's Alpha which led to the removal of Factor 4 and Factor 5 underlying dimensions for demonstrating poor internal consistency, with coefficients 0.38 and 0.36 well below the 0.5 threshold. Discriminant validity and reliability at CFA level were measured using AVE and CR while the models were estimated by applying ML to determine the fit indices.

The individual's assessment of the measurement models of all three CQ aspects (CAW, CU, CQS) permitted the elimination of factor components that loaded below a value of 0.4 rule

of thumb, hence, the deletion of items constant awareness 6, CQ skills 1 and cultural understanding 1 from their respective dimensions. A second estimation of CU model showed that CQ skills 2 loaded below the required threshold and was considered for deletion. All models tested demonstrated perfect or overall good fitting indices, except the initial CQ measurement model that showed poor fitting indices with CMIN/DF (5.26) and RMSEA (0.10) being above their permissible level, while RFI (0.76), CFI (0.85) and TLI (0.80) scored below their required cut-off for good fit. Therefore, an errors correlation technique was applied, and it improved the final CQ model with all indices meeting their permissible level.

Thus, researchers in business management, psychology, and sociology as well as other fields in general, focusing on CQ or EQ in the context of DR Congo, may adopt this model to investigate level of CQ and its aspects. All three underlying dimensions of CQ correlate significantly and positively with each other with medium size effect except for CU and CQS that showed small size effect. However, recommendation is made for further research in different regions of the country, as this study collected data only in Kinshasa Province. The integration of data from other provinces will help in getting a more realistic model to assess level of aspects of CQ beyond Kinshasa province. Also, it will be worth testing other scales, with preference to those integrating motivational CQ component to get better insights into the matter. Likewise, the necessity of investigating workers from the informal sector would be a considerable addition towards understanding the phenomena as they interact in cross-cultural situations, just as their counterparts do in the formal sector.

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