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How does your cultural intelligence contribute to your adjustment? Unveiling the link between cultural intelligence and cross-cultural adjustment using meta-analysis

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Abstract

Purpose – The purpose of this study is to examine the relationship between cultural intelligence (CQ) and cross-cultural adjustment (CCA) using meta-analytic methods. The paper serves a dual purpose as it critically examines the CQ-CCA literature and provides summary effects using meta-analysis to determine how CQ and its facets affect CCA and its three dimensions.

Design/methodology/approach – A meta-analysis of 77 studies involving 18,399 participants was conducted to obtain the summary effects. The studies reporting the relationship of CQ and/or its facets with CCA or any of its dimensions were included in the analysis.

Findings – Results revealed that CQ (overall) and all individual CQs were positively and significantly related to CCA and its three subdimensions. Although CQ (overall) had a strong effect on CCA and moderate to strong effects on all the subdimensions of CCA, the strongest effect size was measured for the relationship of motivational CQ with CCA. Not only this, when individual CQs' relationships were assessed with the individual adjustment dimensions, the motivational aspect of CQ happened to be the most influencing factor, having a close to strong effect on interaction adjustment.

Research limitations/implications – Since the study combines the results from numerous empirical research conducted over time, it avoids the limitations that an individual study has, which is carried out at a single point in time and on a limited sample.

Originality/value – This study adds to the academic research by critically reviewing the CQ-CCA literature. It also works as a guiding map for future research in the area. The study highlights the summary effects for each association between CQ and CCA and their dimensions, elucidating the mixed findings reported in previous research.

Keywords Cultural intelligence, Cross-cultural adjustment, Meta-analysis, Summary effect

Paper type Literature review

1. Introduction

The increasing globalisation and the need to interact with people from different cultural backgrounds have made cultural intelligence (CQ) imperative to the success of individuals

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working in global scenarios. The field of global mobility is gradually witnessing an increase in employees pursuing global careers not just as an expatriate but also as other forms of global workers such as international business travellers (IBTs), short-term international assignees, temporary project teams and flexpatriates (Jooss *et al.*, 2021). Besides, the post-pandemic world is seeing an upsurge in employees shifting to virtual work arrangements, where they now have to engage virtually in cross-cultural relationship formation and interactions (Arslan *et al.*, 2021; Caligiuri *et al.*, 2020). With such progressive adoption of global work arrangements, there is likely to be an increase in the frequency and degree of cross-cultural interactions. Due to increasing multicultural interactions, employees need to enhance their understanding of different cultural situations (Yow *et al.*, 2022). This ability to understand and interpret various cultural settings and exhibit appropriate behaviour suited to that culture is referred to as CQ (Earley, 2002; Earley and Ang, 2003; Thomas and Liao, 2023; Thomas *et al.*, 2015). In an intercultural context, CQ is primarily dependent on four factors: individuals' existing knowledge structure and awareness of different cultural situations (cognitive CQ), their ability to gather culture-related information (metacognitive CQ), their drive towards learning and adapting to a new culture (motivational CQ) and their capability to demonstrate culturally appropriate behaviours (behavioural CQ) (Ang *et al.*, 2006, 2007). Hence, to perform effectively, employees need to be proficient in deciding how to use their capabilities to be attuned to diverse cultural situations.

In addition to CQ, cross-cultural adjustment (CCA) of expatriates is central to cross-cultural assignments and a primary determinant of the success or failure of expatriation assignments (Palthe, 2004; Takeuchi *et al.*, 2005). CCA is defined as the degree to which expatriates are psychologically comfortable with the various aspects of foreign culture (Black, 1988; Black *et al.*, 1991). Technically, these various aspects have been categorised as the three dimensions of CCA, viz., general, work and interaction adjustment. Thus, adjusting to the host community range from being comfortable with carrying out normal day-to-day routine (general adjustment), performing job functions without any cultural hindrances (work adjustment), to being able to successfully interact with colleagues, locals and other host country nationals (HCNs) (interaction adjustment) (Black *et al.*, 1991). While CCA is the essence of traditional expatriation, research has shown that it is also instrumental to employees in other forms of work arrangements, such as IBTs and virtual workers (Carnevale and Hatak, 2020; Dimitrova *et al.*, 2020; Shaffer *et al.*, 2016).

In a cross-cultural context, both these constructs – CQ and CCA, have been widely researched on different types of samples such as expatriates, IBTs, virtual workers, migrants, sojourners and students (see Arli *et al.*, 2023; Carnevale and Hatak, 2020; Dimitrova *et al.*, 2020; Ocampo *et al.*, 2022; Wawrosz and Jurásek, 2023). While CCA is well-established in the literature as a critical and primary source of successful international assignments, the construct of CQ was only explicitly introduced at the dawn of the new millennium by Earley and Ang (2003). Since its inception, this unique cultural quotient construct has garnered significant research interest and is still being applied in various disciplines (see Kadam *et al.*, 2021; Skaria and Montayre, 2023). Over the past two decades, CQ has been the subject of numerous conceptual, empirical and review research, demonstrating the increased interest of scholars in the construct (Fang *et al.*, 2018; Ott and Michailova, 2018; Yari *et al.*, 2020).

Furthermore, considering CCA as the core of cross-cultural assignments, it is critical to understand how it is affected by CQ. How are its three dimensions affected by the four components of CQ? Which facet of CQ affects which dimension of CCA the most? Which CQ facet has the least influence on which CCA dimension? Since CQ and CCA are fundamental to the success of cross-cultural assignments and these issues are only fleetingly touched by researchers, they need to be investigated even more deeply. Several empirical investigations exist that tested the influence of CQ on CCA (Ang *et al.*, 2007; Chen *et al.*, 2010; Malek and Budhwar, 2013; Lee and Sukoco, 2010; Wawrosz and Jurásek, 2023). Unfortunately, the empirical results revealed somewhat mixed findings, with different facets of CQ affecting CCA

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dimensions differently (Moon *et al.*, 2012). For example, Konanahalli *et al.* (2014) found cognitive and motivational CQ to be significant predictors of general, work and interaction adjustment, while Huff *et al.* (2014) and Ramalu *et al.* (2010) found only motivational CQ to be positively related to all aspects of adjustment. On the other hand, Guðmundsdóttir (2015) found meta-cognitive and motivational CQ to be the predictors of expatriates' general, work and interaction adjustment. Besides, some studies have partially used CQ, considering only one or two of its dimensions (Templer *et al.*, 2006). While most of the studies have found overall CQ to predict CCA significantly, there are inconsistencies in results when individual CQ dimensions have been analysed (Lee *et al.*, 2014; Konanahalli *et al.*, 2014; Ocampo *et al.*, 2022).

Nevertheless, a single study conducted on a limited sample is bound to have limitations and research constraints. Thus, a timely meta-analysis is required to understand how CQ impacts CCA when both are used as aggregate constructs. Is CQ more powerful when used as a whole construct or when its components are taken separately? Are all individual CQs equally important for adjustment in cross-cultural scenarios? How do different CQs facilitate different adjustment types? Therefore, the objective of this study is to examine the relationship between CQ and CCA using meta-analytic methods. It aims to assess how the different facets of CQ affect the three CCA dimensions: general, work and interaction adjustment. To investigate the association between the multi-dimensional constructs CQ and CCA, this study probes the following research questions:

RQ1. How does CQ (overall) impact CCA (overall)?

RQ2. Which dimension of CCA is affected the most by CQ (overall)? Which CCA dimension is affected the least by CQ (overall)?

RQ3. Which dimension of CQ affects CCA (overall) the most? Which CQ dimension has the lowest impact on CCA (overall)?

RQ4. Which dimension of CQ affects which dimension of CCA the most? Which CQ dimension affects which CCA dimension the least?

This study also aims to discuss and propose suggestions that future researchers can utilise to develop more coherent work on the subject.

The earlier research has applied meta-analysis to study the causes and effects of expatriate adjustment in overseas assignments. For example, Bhaskar-Shrinivas *et al.* (2005) and Hechanova *et al.* (2003) carried out a meta-analysis of predictors and outcomes of expatriate adjustment. Similarly, Morris and Robie (2001) reviewed the effects of cross-cultural training on expatriate adjustment and performance using meta-analytic methods. Rockstuhl and Van Dyne (2018) made an essential contribution to the field of CQ with their bi-factor model that allows the analysis of individual and combined CQ dimensions simultaneously. The recent meta-analytic review by Schlaegel *et al.* (2021) went even further and explained how CQ dimensions together in certain sets and combinations affect work-related outcomes. This study differs from the previous research by studying all possible combinations of the CQ-CCA relationship, i.e. the combined effect as well as the effect of all individual CQs on CCA and its dimensions. Besides, to keep intact the individuality of different CQ dimensions, this study also focuses on the effect of each CQ dimension on the three facets of CCA.

2. Review of literature and hypotheses development

The term Cultural Intelligence, referred to as CQ, for being an aspect of intelligence, was introduced in Earley's (2002) article and Earley and Ang's (2003) book *Cultural Intelligence: Individual Interactions Across Cultures*. The concept is defined as "an individual's ability to adapt to new and unfamiliar cultural settings, along with their ability to easily and effectively function in situations characterised by cultural diversity" (Ang *et al.*, 2007; Earley and Ang, 2003).

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Being a multidimensional construct, CQ is composed of meta-cognitive, cognitive, motivational and behavioural components (Ang *et al.*, 2007; Earley and Ang, 2003).

Meta-cognitive CQ reflects the ability to gain and interpret knowledge about different cultures. It is a mental process that involves planning and strategising to successfully deal with a foreign country's unique cultural situations (Ang *et al.*, 2007). Cognitive CQ reflects person's knowledge structures and awareness of different cultures. It is a process whereby individuals try to comprehend similarities and differences between cultures, like those relating to the social, economic and legal practices, theological views, the marriage system and the art and craft (Ang *et al.*, 2007; Zhang *et al.*, 2017). The motivational aspect of CQ indicates individuals' inner drive to learn and understand a new culture and the essentials of functioning effectively in intercultural situations. It displays the inherent desire to mingle with people of varied nationalities and the confidence to effectively handle cross-cultural confrontations (Earley and Peterson, 2004). The behavioural dimension of CQ refers to the capability to engage in adaptive behaviours by exhibiting appropriate verbal and nonverbal responses in varied cultural interplays. It involves being flexible and manifesting appropriate behaviour that fit various cross-cultural situations (Ang *et al.*, 2006).

CCA, on the other hand, has repeatedly been touted by researchers as a critical determining factor for cross-cultural assignments' success or failure (Palthe, 2004; Takeuchi *et al.*, 2005). The adjustment has been defined as the degree of psychological comfort and familiarity that employees experience in a culturally different nation. In simple terms, CCA refers to adaptation to the new culture while living and working there (Black, 1988; Black *et al.*, 1991). The three dimensions of adjustment are general adjustment, work adjustment and interaction adjustment. The general adjustment pertains to the comfort with overall living situations in the foreign nation that includes the food, weather and infrastructure. Adjustment to work is defined as the ease with which expatriates handle the job conditions in the host country, like job duties and obligations, expectations and expertise required. Finally, interaction adjustment is the state of ease while interacting with HCNs (Black *et al.*, 1991).

Cultural intelligence seeks to explain individual differences that allow some people to adapt effectively to new cultures, understand existing practices and exhibit the desired response and behaviour. Over the years, several researchers have alluded to the idea that individuals with high CQ are competent enough to assimilate into various cultures. They possess cultural abilities necessary to function effectively in foreign environments (Ang *et al.*, 2007; Templer *et al.*, 2006). Previous studies (e.g., Jyoti and Kour, 2015; Lee and Sukoco, 2010; Lee *et al.*, 2014; Presbitero, 2021; Ramalu *et al.*, 2010; Zhang *et al.*, 2021) suggest a positive association between CQ and CCA. Research, in fact, also indicated that CQ is positively correlated not just with overall CCA but with all its subdimensions-general, work and interaction adjustment (Wawrosz and Jurásek, 2023). Higher CQ is known to help people sail smoothly through the living, work and socialising conditions in the host country by adjusting their behaviours to suit cross-cultural settings (Chen *et al.*, 2014). Therefore, it is proposed that:

H1. CQ (overall) positively influences CCA (overall).

H2. CQ (overall) positively influences the three adjustment dimensions, i.e. general, work and interaction adjustment.

Furthermore, researchers have argued that each component of CQ is distinct and can cause different impacts on outcomes (Rockstuhl and Van Dyne, 2018). All four of its components – metacognitive, cognitive, motivational and behavioural CQ are known to have their own unique characteristic and relevance (Ang *et al.*, 2007; Thomas and Liao, 2023). Metacognitive component of CQ indicates higher-order cognitive practices, allowing people to acquire and interpret diverse cultural situations (Ang *et al.*, 2006). As metacognition involves the awareness of and control over cogitations linked to cultures, it helps individuals apply their understanding of cultural cues in

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dealing with cross-cultural scenarios. People with high metacognitive CQ are believed to be aware and mindful of everyone's cultural norms and beliefs and are flexible enough to adjust their mental models to improve cross-cultural interactions (Earley and Peterson, 2004; Zhang *et al.*, 2017). The improved interactions are further expected to enhance adjustment to different cross-cultural scenarios, like adaptation to general living and work conditions and socialising with host nationals. The cognitive dimension of CQ refers to the knowledge of cultural settings and norms acquired through education and personal experiences. A strong knowledge about different cultures and societies helps individuals better interpret cultural interactions (Zhang *et al.*, 2017). Also, people with high cognitive CQ are believed to deal effectively with environmental uncertainties because of their knowledge of cultural differences. Greater tolerance of uncertainty and expectation management helps in better adaptation (Thomas and Inkson, 2004; Zhang *et al.*, 2017). Motivational CQ refers to the inner drive to effectively channel energy and attention toward learning to perform in cross-cultural situations. Individuals high on motivational CQ are intrinsically stimulated to engage in novel cultural experiences and are enthusiastic about socialising with people from unfamiliar cultural backgrounds (Earley and Ang, 2003; Templer *et al.*, 2006). Behavioural CQ helps a person with behavioural repertoire responses to deal with distinct cultural situations. People with high behavioural CQ are expected to manifest appropriate verbal and non-verbal responses, such as proper use of terms and expressions while speaking, pitches, sounds, facial expressions, signs, signals and body language (Earley, 2002; Ang *et al.*, 2006). Thus, behavioural CQ should help experience better adjustment, allowing people to exert appropriate behaviour in different cultural settings.

Additionally, results found in the recent research by Kour and Jyoti (2022) pointed out that in addition to CQ positively influencing CCA, all the individual dimensions of CQ also have a positive effect on all the dimensions of CCA. For instance, previous studies examined how metacognitive CQ affects the three dimensions of adjustment (Akhal and Liu, 2019; Guðmundsdóttir, 2015). These studies found a positive effect of metacognitive CQ on all three adjustment dimensions. Similarly, researchers (e.g., Konanahalli *et al.*, 2014) have also reported positive relations between cognitive CQ and CCA dimensions. In the same manner, prior research also shows a positive and significant association between motivational CQ and adjustment dimensions (Guðmundsdóttir, 2015; Ramalu *et al.*, 2010; Song *et al.*, 2023; Templer *et al.*, 2006; Yow *et al.*, 2022). Interestingly, previous studies on the relations of behavioural CQ with CCA factors have shown negative and non-significant results (e.g. Akhal and Liu, 2019; Guðmundsdóttir, 2015; Ramalu *et al.*, 2010). However, Akhal and Liu (2019) reported a positive association between behavioural CQ and interaction adjustment. Also, Black (1990), in his study on Japanese expatriates, found behavioural flexibility to be associated with general, interaction and work adjustment. Based on the above discussion, the following hypothesis is proposed:

H3. Each of the four CQ dimensions i.e. metacognitive, cognitive, motivational and behavioural CQ, positively influences CCA (overall).

H4. Each of the four CQ dimensions i.e. metacognitive, cognitive, motivational and behavioural CQ, positively influences the three adjustment dimensions. i.e. general, work and interaction adjustment.

The proposed hypotheses have been depicted using four models presented in Figure 1.

3. Methodology

3.1 Literature search and inclusion criteria

To find the relevant articles for meta-analysis, we attempted to locate published and unpublished studies examining CQ's association with CCA. Firstly, we searched the

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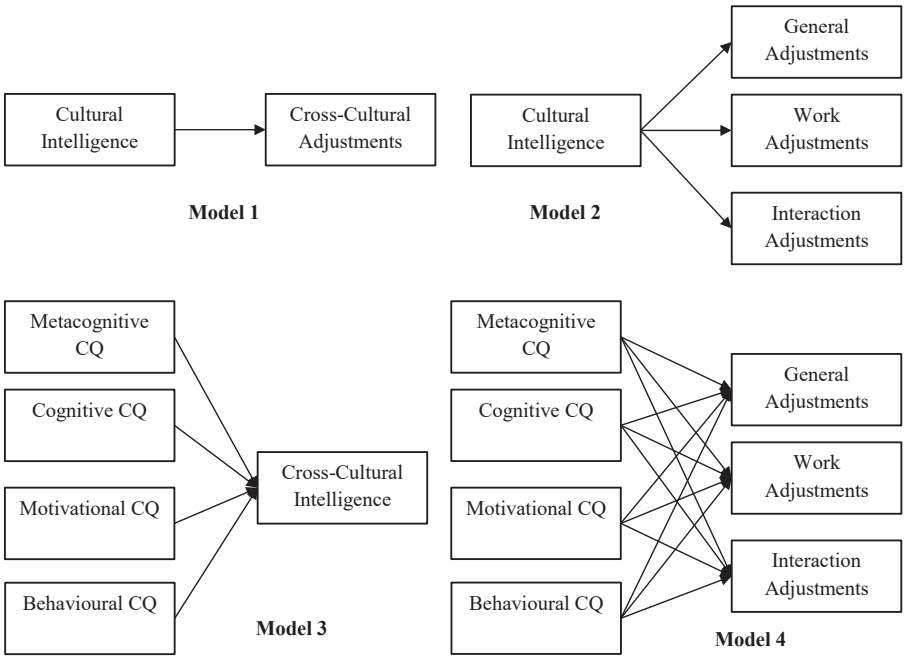

Figure 1.
Proposed conceptual models

Source(s): Authors

electronic databases of management and psychology (EBSCO, Scopus, Web of Science: core collection, ProQuest: ABI/INFORM Collection and PsycINFO) using a combination of keywords like:

> *cultural intelligence* OR *"CQ"* AND *"expatriate adjustment"* OR *"adjustment"* OR *"cultural adjustment"* OR *"cross-cultural adjustment"* OR *"CCA"* OR *"acculturation"* OR *adaptation.*

The searches were made in title, abstract and keywords, for research articles that are published in journals, book chapters, case studies or conference abstracts. Since the concept of CQ was formally introduced in 2002, we restricted the search to studies published between 2002 and 2023. The search produced more than 5,800 results across all databases.

For more comprehensive and effective results, we devised specific criteria for an article to be included or excluded in the review. Firstly, only empirical papers published in the English language were included. Secondly, the articles had to have presented empirical data on CQ and CCA and utilised quantitative analysis to get their findings. Thus, the qualitative and conceptual papers on CQ-CCA association were excluded. Thirdly, the hypothesised relationships had to be reported with either a Pearson's correlation coefficient (r) or any other statistics (β coefficient or Student's t) that can be converted into an effect size. Besides, for dimensions of CCA, we considered the sociocultural model involving general, work and interaction adjustment dimensions and did not include studies measuring psychological adjustment. Although sociocultural and psychological adjustment models have been argued to be conceptually similar, they tend to be empirically different as they have been derived from distinct theoretical frameworks (Bhaskar-Shrinivas *et al.*, 2005; Guðmundsdóttir, 2015). Additionally, the sociocultural adjustment model proposed by Black *et al.* (1991) is established and often cited and is considered a seminal theoretical contribution to the field of

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CCA (Bhaskar-Shrinivas *et al.*, 2005; Strubler *et al.*, 2011). For any difference in terminology for denoting the variables, the scale items were assessed and discussed among the authors to put the variable in a relevant category.

Furthermore, we acknowledge that the concept of CQ exists in multiple disciplines and literature, such as anthropology, psychology, medicine and neurosciences; we excluded articles from these disciplines. The next inclusion criterion relates to the level of analysis of CQ. We included only those studies that conceptualised CQ as an individual-level construct. Thus, articles studying group, team or organisational level CQ were excluded.

We first assessed the articles based on titles and abstracts. After excluding the apparent misfits, the full text of the rest of the articles was assessed. Besides, we scoured the selected studies' references to ensure all potential articles were included. We ensured the selected studies' independence by carefully analysing each study for its context, sample and statistical results. Only one sample was included when two or more studies were found to have used the same dataset. Besides, for articles reporting two or more samples, each dataset was treated independently in the meta-analysis (Hunter *et al.*, 1982).

The whole process yielded 77 studies to be included in the review. These 77 studies include 65 journal articles, 8 dissertations, 2 book chapters and 2 conference papers. The inclusion and exclusion procedure has been documented with a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart, as shown in Figure 2.

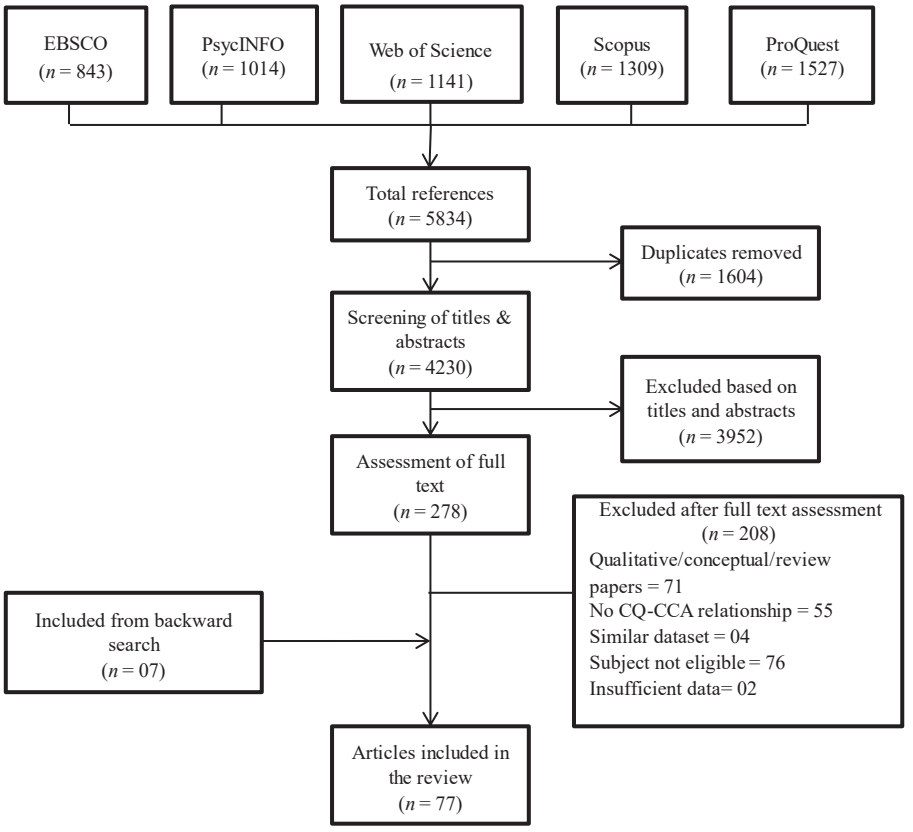

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Figure 2.
PRISMA flowchart

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3.2 Coding of studies

Coding was done for the 20 associations between CQ, CCA and their dimensions. These 20 associations include the CQ-CCA relationship, CQ's relationship with the 3 dimensions of CCA, individual CQs' relationship with CCA and the relations of 4 individual CQs with the three CCA dimensions. In addition to coding the relationship between the variables, we coded the effect sizes (correlations), the sample sizes, the reliabilities, means and standard deviations of the variables. Two authors did the coding process independently for each study to corroborate the coding quality. The inter-rater reliability ranging from 0.92 to 0.99 was acceptable, ensuring the adequacy of the coding procedure (Perreault and Leigh, 1989). Any disagreement during the process was settled with discussions among authors. We also noted each study's major methodological limitations to critically analyse the restrictions of individual research. By reviewing the methodology-related limitations of the included studies, we also aim to provide a guiding map for future empirical research in this area. The 77 studies included in the analysis involve the samples of expatriates, global managers and international students. Table 1 shows the summary list of articles used for meta-analysis.

4. Analysis and results

4.1 Descriptive statistics

The descriptive statistics offer valuable insights into the studies, allowing better understanding of the landscape of research on CQ and CCA. This section provides an overview of the key findings and trends observed within the dataset.

To begin with, Table 1 summarises the distribution and characteristics of the included studies. The table highlights the temporal trend of CQ research, the geographic scope of the studies and the sectors in which CQ has been examined. It offers a snapshot of the studies contributing to this meta-analysis. Notably, most of these studies (72 out of 77) were published between 2010 and 2023, indicating a significant growth in empirical research on CQ since 2009 (Ott and Michailova, 2018). This upsurge reflects the increasing recognition of CQ as an inherent component of cross-cultural research. The 77 studies encompass diverse samples from different countries and regions, including China, Taiwan, Korea, Thailand, Britain, Japan, the USA, India, Australia, Indonesia and Europe. Twenty-three studies involve samples of expatriates and global professionals from multiple countries or regions. Besides, 20 studies made use of international students' samples. Additionally, the samples in included studies were based in various host nations like Malaysia, the USA, Singapore, China, Australia, New Zealand, Japan, Taiwan, India, the UK and Saudi Arabia. The concept of CQ has been studied across various sectors, such as information technology, education, banking, manufacturing, service and construction, demonstrating its applicability and relevance in different industries. Moreover, this study boasts a robust cumulative sample size of 18,399, reflecting a substantial and diverse sample from various countries and regions.

Table 2 presents descriptive statistics on the dataset's key metrics. It provides information on the number of studies examining each relationship (k-value), the cumulative sample sizes, average sample sizes, the range of sample sizes and the range of correlations. The 77 studies included in the meta-analysis generated a comprehensive set of 405 associations among CQ, CCA and their dimensions. The average sample sizes across all the relationships examined range from 180 to 239, indicating a consistent and reliable representation of participants. The wide range of sample sizes utilised in the studies spans from a minimum of 50 to a maximum of 619 participants. Additionally, the correlation values observed in the studies, ranging from −0.52 to 0.86, demonstrate the spectrum of associations between CQ and CCA. This diverse range of correlations reflects the breadth of relationships explored and further enriches the depth of analysis in this study. These statistics offer important insights into the composition and characteristics of the dataset, enabling a better understanding of the meta-analytic results.

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Table 1. Summary of articles in the review

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
1	Templer *et al.* (2006)	Journal article	157	Global Professionals of varied nationality	Multi-industry	- Self-reported predictors and criteria - Generalisability concerns	Australia
2	Ang *et al.* (2007)	Journal article	N1 = 235 N2 = 358	International students	No specific sector	- Limitation in geographic scope	USA and Singapore
3	Ward and Fischer (2008)	Book chapter	346	International students	No specific sector	- Self-reported measures - Cross-sectional design	–
4	Williams (2008)	Dissertation	295	Business expatriates from the USA	No specific sector	- Self-reported data - Low response rate - Generalisability	USA
5	Ward *et al.* (2009)	Journal article	118	International students	Education	- Self-report measures	New Zealand
6	Ramalu *et al.* (2010)	Journal article	332	Expatriates of varied nationalities	Service, Manufacturing and others	- Self-reported measures - Common method bias problem - Cross-sectional design	Malaysia
7	Lee and Sukoco (2010)	Journal article	218	Taiwanese expatriates	Manufacturing and service industry	- Cross-sectional design - Sample limited to Asia only - Generalisability concerns	China, Vietnam and other Southeast Asian countries
8	Nguyen (2010)	Dissertation	57	International students	Education	- Self-reported survey	USA
9	Wu and Ang (2011)	Journal article	169	Expatriates of varied nationalities	No specific sector	- Cross-sectional design - Common method biases - Generalisability concerns	Singapore
10	Moon *et al.* (2012)	Journal article	190	Korean Expatriates	Electronic, Chemical, International Trade, Information Technology, Apparel, Automobile	- Common source bias - Cross-sectional design - Generalisability concerns due to limited sample	USA, China, Japan, Germany and Hong Kong

(*continued*)

Table 1.

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
11	Ramalu *et al.* (2012)	Journal article	332	Expatriates of varied nationalities	Service, Manufacturing and others	- Self-report measures - Cross-sectional data	Malaysia
12	Lu (2012)	Dissertation	226	Expatriates of varied nationalities	–	- Self-reported survey - Cross-sectional design	China
13	Lin *et al.* (2012)	Journal article	295	International students	Education	- Self-reported measures - Generalisability concerns	Taiwan
14	Evans (2012)	Dissertation	111	Expatriates and students	Education	- Single-source data	USA
15	Huff (2013)	Journal article	140	SIEs of varied nationalities	Education	- Common method bias - Cross-sectional design	Japan
16	Lee *et al.* (2013)	Journal article	156	Taiwanese expatriates	Manufacturing and service industry	- Cross-sectional design - Self-reported questionnaire - Small sample size - Generalisability concerns	China
17	Zhang (2013)	Dissertation	239	Australian and Chinese expatriates	Multi-industry	- Self-reported measures	Australia
18	Malek and Budhwar (2013)	Journal article	134	Expatriates of varied nationalities	No specific sector	- Small sample size - Cross-sectional design - Self-rated - Generalisability	Malaysia
19	Siamwalla (2013)	Journal article	387	British expatriate	–	- Self-reported survey - Generalisability concerns	Thailand
20	Klafehn *et al.* (2013)	Journal article	50	International students	Education	- Self-report measure	USA
21	Ng and Tan (2013)	Journal article	83	Expatriates of varied nationalities	–	- Generalisation concerns	Malaysia

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Table 1.

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
22	Lee *et al.* (2014)	Journal article	256	Taiwanese expatriates	Industrial and Construction	- Limited sample	China and Vietnam
23	Konanahalli *et al.* (2014)	Journal article	191	British expatriate	Architectural, engineering and construction sector	- Small sample size - Self-reported questionnaires - Generalisability concerns - Cross-sectional research design	29 different countries (UAE, India, China, South Africa, etc.)
24	Huff *et al.* (2014)	Journal article	154	SIEs of varied nationalities	Education	- Self-report measures	Japan
25	Lee and Kartika (2014)	Journal article	287	Expatriates of varied nationalities	No specific sector	- Cross-sectional design - Self-report survey	Taiwan and China
26	Chen *et al.* (2014)	Journal article	260	International students	Education	- Cross-sectional design - Common method variance	Taiwan
27	Guðmundsdóttir (2015)	Journal article	178	Nordic Expatriates	No specific sector	- Self-report questionnaires - Cross-sectional methodology - Sample size	USA
28	Jyoti and Kour (2015)	Journal article	225	Indian bank managers	Banking	- Cross-sectional design	India
29	Chen (2015)	Journal article	393	Foreign labourers from the Philippine Islands	Technology manufacturing industries	- Female sample only - Common method bias - Generalisability concerns	Taiwan
30	Diemer (2016)	Dissertation	88	US Expatriates	No specific sector	- Self-reported survey - Common method variance - Cross-sectional design - Generalisability	China

(*continued*)

Table 1.

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
31	Grelecka (2016)	Dissertation	165	European expatriates	–	- Self-reported survey	Poland
32	Zhang and Oczkowski (2016)	Journal article	238	Australian and Chinese expatriates	–	- Self-reported measures - Sample size concerns	Australia and China
33	Presbitero (2016)	Journal article	189	International students	Education	- Cross-sectional design	Australia
34	Tsay and Liou (2016)	Journal article	179	International students	Education	–	UK and USA
35	Nunes *et al.* (2017)	Journal article	217	Expatriates of varied nationalities	No specific sector	- Cross-sectional design	Brazil
36	Rodsai *et al.* (2017)	Journal article	117	Thai expatriates	General construction, automotive construction, banking, machinery, fuel industry and others	- Small and limited sample	Indonesia
37	Shu *et al.* (2017)	Journal article	355	International students	No specific sector	- Cross-sectional research - Common method bias - Generalisability - Limited sample	USA
38	Sambasivan *et al.* (2017)	Journal article	139	Expatriates of varied nationalities	Service, Manufacturing and others	- Sample limited to a few industries - Low sample size	Malaysia
39	Chao *et al.* (2017)	Journal article	254	International students	Education	- Self-reported survey	China
40	Wilson *et al.* (2017)	Journal article	316	Migrants from varied nationalities	No specific sector	- Cross-sectional design	New Zealand, Canada, USA
41	Presbitero (2017)	Journal article	110	Religious expatriates	Religion	- Self-reported survey	USA, Asia, Europe, Australia

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Table 1.

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
42	Jyoti and Kour (2017)	Journal article	342	Indian bank managers	Banking	- Cross-sectional design	India
43	Iskhakova (2018)	Journal article	189	International students	No specific sector	- Self-report survey - Single-source bias - Generalisability - Limited sample	Australia
44	Uen *et al.* (2018)	Conference Paper	118	Taiwanese expatriates	–	–	–
45	Nguyen *et al.* (2018)	Journal article	79	American students	Education	- Small sample size	USA
46	Patrick and Ravindra (2018)	Journal article	145	Expatriates of varied nationalities	–	- Small sample size	India
47	Akhal and Liu (2019)	Journal article	402	Professionals of varied nationalities	No specific sector	- Cross-sectional design - Single rater	Mainland China
48	Wang *et al.* (2019)	Journal article	230	Expatriates of varied nationalities	Manufacturing, service, electronic and information technology and trading industry	- Sample size	Taiwan and China
49	Jyoti *et al.* (2019)	Book chapter	512	Indian bank managers	Banking	- Single source measures - Cross-sectional data	India
50	Chew *et al.* (2021)	Journal article	237	Expatriates of varied nationalities	No specific sector	- Cross-sectional design - Single-source data	Southeast Asia, the Arab Gulf states and Australia
51	Malek *et al.* (2019)	Journal article	105	Foreign academics (SIEs)	Education	- Cross-sectional design - Single source of data - Generalisability concerns	Peninsular Malaysia

(*continued*)

Table 1.

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
52	Tantong and Rojjanaprapayon (2019)	Conference Paper	92	Foreign lecturers	Education	- Self-reported survey - Low sample size Generalisability concerns	Thailand
53	Sharma and Hussain (2019)	Journal article	246	Northeastern Indian diaspora	–	- Self-reported survey - Cross-sectional design	India
54	Varela (2019)	Journal article	98	International students	Education	- Sample concerns	Mexico
55	Viswanathan *et al.* (2019)	Journal article	470	Indian expatriates	IT sector	- Cross-sectional design - Self-reported measures	USA
56	Setti *et al.* (2022)	Journal article	151	Expatriates of varied nationalities	Energy	- Cross-sectional design - Self-reported measures - Sample size	The Middle East, North America, Europe, Latin America, Africa, Asia, Australia
57	Dinglasa (2020)	Journal article	483	Filipino Expatriates	No specific sector	Not mentioned	Saudi Arabia
58	Arokiasamy and Kim (2020)	Journal article	107	Japanese PCNs	No specific sector	- Self-report survey - Sample size	Malaysia
59	Mahmud *et al.* (2020)	Journal article	103	Expatriates of varied nationalities	Multi-industry	- Limited sample	Malaysia
60	Hu *et al.* (2020)	Journal article	247	International students	Education	- Single source of data - Cross-sectional design - Generalisability concerns	Taiwan
61	Khan *et al.* (2020)	Journal article	202	International students	Education	- Cross-sectional design - Sample size concerns	–
62	Sharma and Hussain (2020)	Journal article	246	Northeast Indian ethnic minority diaspora	Education and Religion	- Self-reported and cross-sectional data	India

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Table 1.

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
63	Kadam *et al.* (2021)	Journal article	315	Indian employees	IT sector	- Cross-sectional research - Self-report survey	India
64	Song *et al.* (2023)	Journal article	242	Chinese expatriates	No specific sector	- Self-report questionnaire - Limited sample representation concerns	25 different countries (Brazil, Russia, Saudi Arabia, France, etc.)
65	Oh and Jang (2021)	Journal article	120	South Korean SIEs	Construction, manufacturing, service and electronics	- Self-reported and cross-sectional data - Common method variance (CMV)	Vietnam
66	Zhang *et al.* (2021)	Journal article	387	Chinese expatriates	Multi-industry	- Self-reported - Cross-sectional data	Belt and road area (Malaysia, the Philippines, New Zealand and South Africa)
67	Presbitero (2021)	Journal article	215	Expatriates of varied nationalities	–	- Cross-sectional data	Australia
68	Hong *et al.* (2021)	Journal article	194	International students	Education	- Sample concerns - Cross-sectional data	Malaysia
69	Jurásek and Wawrosz (2021)	Journal article	191	International students	Education	- Cross-sectional design - Sample concerns - Self-reported data	Czech
70	Yow *et al.* (2022)	Journal article	191	Professionals of varied nationality	Construction	- Control variables not included - Limited generalisability	Australia and Oceania, Asia, Africa, Europe, America
71	Kour and Jyoti (2022)	Journal article	530	Indian bank managers	Banking	- Cross-sectional design	India

(*continued*)

Table 1.

S. No.	Study	Article type	Sample size (N)	Sample characteristics	Sector	Major reported limitations (Methodology-related)	Host Country(s)/ Country(s) where study was carried out
72	Ocampo *et al.* (2022)	Journal article	N1 = 168 N2 = 150	Filipino migrant workers	Multi-industry	- Sample concerns	Saudi Arabia, the United Arab Emirates and Qatar
73	Ayoko *et al.* (2022)	Journal article	241	Global employees of varied nationalities	–	- Cross-sectional design - Small sample - Self-reported data	France and the UK
74	Tripathi (2022)	Dissertation	209	Indian expatriates	Multi-industry	- Self-reported data - Cross-sectional design - Generalisation concerns	30 different countries
75	Wawrosz and Jurásek (2023)	Journal article	189	International students	No specific sector	- Cross-sectional design	Czech Republic
76	Reed *et al.* (2023)	Journal article	126	Expatriates of varied nationalities	–	- Cross-sectional design	Switzerland
77	Arli *et al.* (2023)	Journal article	N1 = 619 N2 = 569	Citizens and migrants from Australia and Indonesia	Multi-industry	- Cross-sectional design	Australia and Indonesia

Source(s): Compiled by authors

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Model	Pairwise relationship	No. of studies (k)	Cumulative sample size	Average sample size	Range of sample sizes Min	Range of sample sizes Max	Range of correlations Min	Range of correlations Max
M1	CQ-CCA	35	8,278	237	79	619	−0.52	0.86
M2	CQ-GA	14	3,342	239	57	470	0.22	0.57
	CQ-WA	13	3,082	237	57	470	0.18	0.66
	CQ-IA	11	2,554	232	57	393	0.28	0.70
M3	MCCQ-CCA	15	2,701	180	50	295	−0.01	0.76
	CCQ-CCA	14	2,651	189	83	295	−0.04	0.67
	MCQ-CCA	14	2,651	189	83	295	−0.36	0.83
	BCQ-CCA	15	2,967	198	83	316	0.05	0.82
M4	MCCQ-GA	19	4,410	232	117	483	0.06	0.66
	MCCQ-WA	21	4,616	220	88	483	0.07	0.71
	MCCQ-IA	20	4,752	238	117	483	0.12	0.68
	CCQ-GA	23	5,298	230	107	483	0.10	0.63
	CCQ-WA	25	5,504	220	88	483	0.04	0.66
	CCQ-IA	24	5,640	235	107	483	0.11	0.60
	MCQ-GA	25	5,936	237	117	483	0.09	0.75
	MCQ-WA	26	5,796	223	88	483	−0.18	0.74
	MCQ-IA	25	5,932	237	117	483	0.19	0.75
	BCQ-GA	21	4,896	233	117	483	−0.04	0.73
	BCQ-WA	23	5,102	222	88	483	−0.18	0.76
	BCQ-IA	22	5,238	238	117	483	0.13	0.75

Note(s): CQ: Cultural intelligence; CCA: cross-cultural adjustment; MCCQ: metacognitive cultural intelligence; CCQ: cognitive cultural intelligence; MCQ: motivational cultural intelligence; BCQ: behavioural cultural intelligence; GA: general adjustment; WA: work adjustment; IA: interaction adjustment
Source(s): Computed by authors

Table 2.
Descriptive statistics

4.2 Robustness test

Since 20 out of the 27 studies used in the meta-analysis used international students' samples, we conducted a robustness test to check if there is any significant difference between the *employee-only* and the *general sample* (including both employees and students). It may be possible that the process through which students adjust to a new context might have idiosyncratic differences from global employees, which might influence the CQ-CCA relationship. Hence, to ensure the robustness of the present meta-analytic results, we separated the articles with the students' samples and conducted similar tests on the remaining 57 studies with *employee-only* samples. Results obtained from the *employee-only* samples were then compared with the results of the *general sample* using a *t*-test. The results of both groups were almost similar, with differences in values ranging between ±0.05 only. The resulting *p*-values from the *t*-tests for the four models presented in Figure 1 were M1: 0.571, M2: 0.074, M3: 0.061 and M4: 0.055, indicating no significant difference between the *employee-only* and the *general sample*.

4.3 Critical analysis of studies' methodological limitations

Four common methodological limitations that emerged during the critical review of the limitations of each selected empirical study are as follows:

(1) *Cross-sectional Design*

Most of the reviewed research studies suspect the future applicability of causal relationships established from their findings because the responses were collected at one point in time only

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(e.g., Arli *et al.*, 2023; Jyoti and Kour, 2015; Kadam *et al.*, 2021; Malek and Budhwar, 2013; Reed *et al.*, 2023; Wawrosz and Jurásek, 2023; Wu and Ang, 2011). A cross-sectional design may limit a study's findings to a specific point in time as situational factors may influence the results.

(2) *Common Method Bias Issues*

The other drawback revealed is the exclusive use of self-reported questionnaires in studies (e.g., Arokiasamy and Kim, 2020; Ayoko *et al.*, 2022; Guðmundsdóttir, 2015; Kadam *et al.*, 2021; Konanahalli *et al.*, 2014; Song *et al.*, 2023; Zhang *et al.*, 2021). More than half of the studies included in the review collected data from a single source i.e. self-rated by expatriates. Prior research has shown that self-evaluated data is prone to show inflated results as it is likely to be influenced by social desirability bias (Rockstuhl and Van Dyne, 2018).

(3) *Generalisability Concerns*

The research context and sample in most of the studies reviewed were very specific, like Korean expatriates (Moon *et al.*, 2012), Chinese expatriates (Lee *et al.*, 2014; Song *et al.*, 2023) or expatriates working in the same foreign nation (e.g., Hu *et al.*, 2020; Templer *et al.*, 2006). Research conducted in a particular context or on a specific sample limits the findings to the said setting only and cannot be applied to a wider scenario.

(4) *Small Samples*

Another limitation frequently appearing in reviewed studies was a small sample size (e.g., Arokiasamy and Kim, 2020; Jurásek and Wawrosz, 2021; Lee *et al.*, 2013; Setti *et al.*, 2022; Wang *et al.*, 2019). However, small samples are often criticised for producing results having low statistical significance (Hair *et al.*, 1998). Thus, a larger sample is desirable for ensuring reliable research results.

4.4 Meta-analytic results

The meta-analysis was carried out in the Jamovi (version 2.3.26) using the "MAJOR for meta-analysis" module. The correlation coefficient was used as the effect size metric for carrying out the analysis. The software generates the effect size estimates, the *Z*-value reflecting the normal standard deviation, the upper and lower confidence interval levels and the heterogeneity and publication bias results. Table 3 provides the meta-analytic results for the relationships among CQ, CCA and their dimensions. The combined effect sizes for all pairwise relationships are depicted in four models presented in Figure 3.

4.5 Effect size

We have used the correlation coefficient as the effect size metric to understand the relationship between CQ and CCA determinants. Effect size can be used to understand the magnitude of a phenomenon contained in the population. Based on the magnitude, effect sizes can be strong (0.5), moderate (0.3) or weak (0.1). Thus, a higher effect size metric results from a more significant subject phenomenon in the population (Cohen *et al.*, 1983).

We followed the guidelines of Hunter *et al.* (1982) to conduct our analysis. We corrected for sampling error by taking the sample size of each study as weights and calculating the sample size adjusted mean (Table 3) using the given formula:

$$r_{+} = \frac{\sum N_i r_i}{\sum N_i}$$

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Model	Pairwise relationship	Sample-size weighted correlation mean (r+)	Combined effect size (Estimates)	*Z*-value	95% confidence interval		Test of heterogeneity		Egger's regression coefficient (*p*-value)
					Lower bound	Upper bound	*Q*-statistic	I^2	
M1	CQ-CCA	0.418	0.527*	8.78	0.40	0.64	1758.07*	96.53%	−0.27 (0.7)
M2	CQ-GA	0.404	0.438*	11.6	0.36	0.51	58.19*	77.34%	−0.26 (0.7)
	CQ-WA	0.403	0.442*	8.17	0.33	0.54	105.24*	88.18%	−0.20 (0.8)
	CQ-IA	0.468	0.514*	10.2	0.41	0.61	54.79*	83.39%	−0.15 (0.8)
M3	MCCQ-CCA	0.402	0.423*	6.13	0.28	0.55	170.57*	91.86%	−1.67 (0.09)
	CCQ-CCA	0.325	0.346*	5.79	0.22	0.46	120.70*	89.01%	−0.53 (0.5)
	MCQ-CCA	0.494	0.556*	5.31	0.35	0.76	309.63*	96.46%	−1.21 (0.2)
	BCQ-CCA	0.365	0.424*	5.36	0.26	0.57	274.40*	94.44%	0.04 (0.9)
M4	MCCQ-GA	0.334	0.354*	9.16	0.27	0.43	115.36*	84.16%	−0.61 (0.5)
	MCCQ-WA	0.328	0.354*	8.36	0.27	0.43	157.35*	87.39%	−0.64 (0.5)
	MCCQ-IA	0.330	0.344*	9.85	0.27	0.41	105.31*	81.92%	−0.90 (0.3)
	CCQ-GA	0.314	0.333*	9.40	0.26	0.40	158.91*	84.38%	−0.16 (0.8)
	CCQ-WA	0.294	0.316*	8.08	0.23	0.39	196.26*	87.61%	−0.29 (0.7)
	CCQ-IA	0.334	0.352*	11.5	0.29	0.41	123.88*	80.1%	−0.15 (0.8)
	MCQ-GA	0.427	0.472*	11.8	0.39	0.55	216.54*	89.08%	−0.08 (0.9)
	MCQ-WA	0.360	0.392*	8.68	0.30	0.48	262.80*	91.26%	−0.50 (0.6)
	MCQ-IA	0.439	0.487*	12.0	0.40	0.56	216.23*	89.34%	−0.29 (0.7)
	BCQ-GA	0.291	0.309*	6.36	0.21	0.40	250.54*	91.07%	−0.47 (0.6)
	BCQ-WA	0.281	0.296*	5.67	0.19	0.39	295.75*	92.55%	−0.85 (0.3)
	BCQ-IA	0.340	0.367*	8.21	0.27	0.45	224.97*	90.12%	−0.51 (0.6)

Note(s): CQ: Cultural intelligence; CCA: cross-cultural adjustment; MCCQ: metacognitive cultural intelligence; CCQ: cognitive cultural intelligence; MCQ: motivational cultural intelligence; BCQ: behavioural cultural intelligence; GA: general adjustment; WA: work adjustment; IA: interaction adjustment

Source(s): Computed by authors

Table 3.
Meta-analytic results

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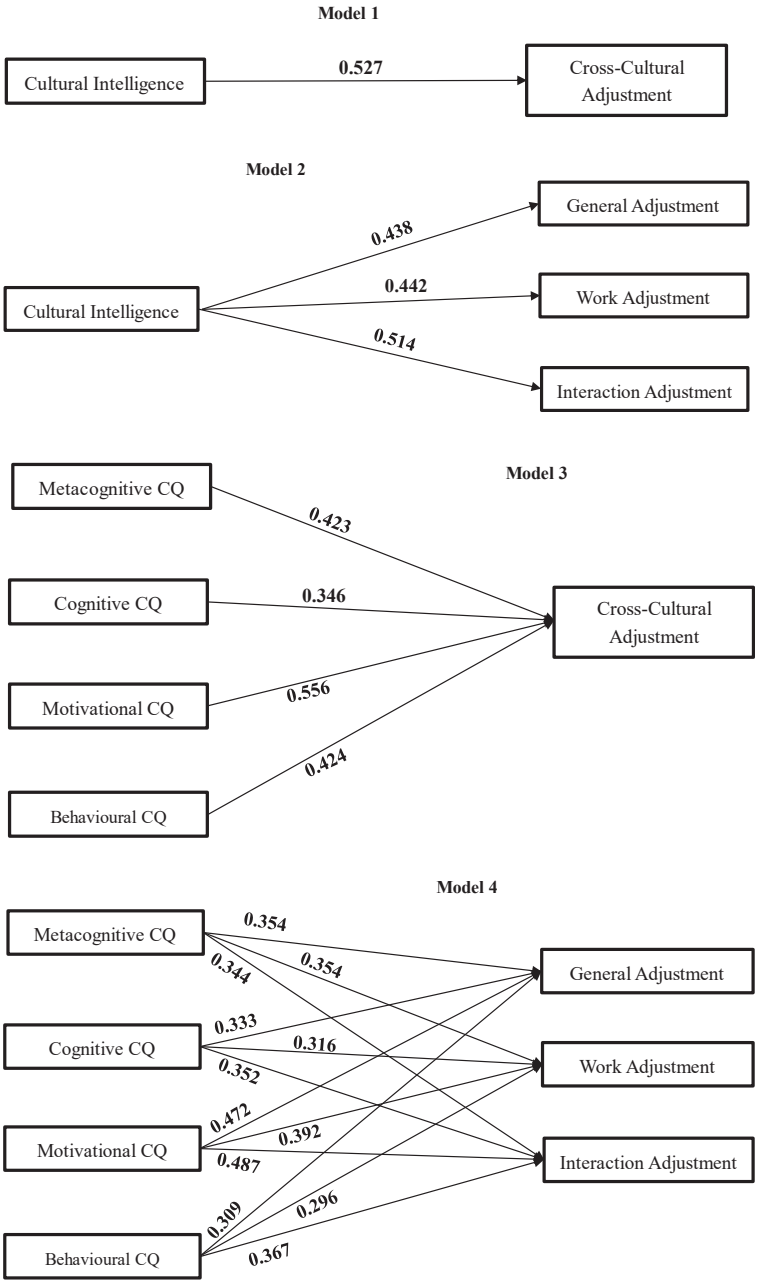

Figure 3.
Combined effect sizes

Source(s): Computed by authors

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where r_+ is the sample size weighted mean, N is each study's sample size, and r_i is the reported correlation in a specific study i. The sample size weighted correlation helps minimise attenuation bias due to sampling error and obtain more accurate effect size estimates by giving large weights to results from larger samples.

4.6 Heterogeneity test

Test of heterogeneity is essential to determine if the sampled studies are significantly different. Q-statistics and the I-squared (I^2) values are used to determine the heterogeneity of the studies, which is consistent with the recommendations of Higgins *et al.* (2003). A significant Q value indicates some unobserved variable that might affect the relationship under investigation (Lipsey and Wilson, 2001). Besides, the I^2 numbers indicate the level of observed variance across sampled studies due to heterogeneity. Higgins *et al.* (2003) indicated that the varying degrees of heterogeneity are low (25%), moderate (50%) and high (75%). Thus, a higher value of I^2 reflects more significant heterogeneity across studies. Heterogeneity or homogeneity in a study helps decide whether the fixed or the random effect model will investigate the relationships. Fixed effect presupposes a single common effect across the population, whereas random effect assumes varying effect sizes across the population. The fixed effect model is suggested to be used in homogenous studies, whereas heterogeneous studies call for using the random effect model (Borenstein *et al.*, 2007).

The results of heterogeneity are shown in Table 3. The obtained Q-statistics (ranging from 54.79 to 1758.07) were highly significant. Also, the I^2 values greater than 75% for all relationships show high heterogeneity in sampled studies. Heterogeneity or variability could have resulted from varying sample units (e.g., organisation-assigned or self-initiated expatriates, international students and global professionals) included in the sampled studies. Thus, the random effect model was applied to probe the associations in our study.

4.7 Publication bias test

A publication bias test is essential to confirm the non-existence of the file drawer problem. As the name suggests, a file drawer is a case where studies with non-significant results have difficulty getting published and often end up being left in the file drawer (Hedges and Olkin, 1985; Rosenthal, 1979). We assessed publication bias through Egger's regression tests (Egger *et al.*, 1997). The p-value was used to examine the statistical significance of publication bias. Table 3 shows that the p-values were greater than 0.05 for all pairwise relationships, indicating that publication bias is not an issue in this study.

4.8 Hypothesis test results

To test the proposed hypotheses, the effect size estimates were calculated for each pairwise relationship. The first two hypotheses (H1 & H2) that predicted the positive relationship of CQ with CCA and its dimensions were supported with CQ having a strong effect on CCA (estimate = 0.527) and moderate to strong effects on its dimensions (estimates = GA: 0.438, WA: 0.442 and IA: 0.514). Besides, all individual CQs also had a positive and significant association with CCA (estimates = MCCQ: 0.423, CCQ: 0.346, MCQ: 0.556 and BCQ: 0.424), supporting H3. Moreover, the four individual CQs were also significantly related to the three adjustment dimensions, supporting the last hypothesis, H4. The effect size estimates for the individual dimensions of CQ and CCA ranged from 0.296 to 0.487, with behavioural CQ having the lowest impact on work adjustment and motivational CQ having the highest impact on interaction adjustment.

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5. Conclusion, discussion and implications

The study examined the relationship between CQ and CCA using meta-analytic methods. Specifically, the study aimed to measure all possible combinations of relationships between the two constructs, i.e. when they are measured as aggregate constructs and when their individual dimensions have been assessed. A meta-analysis of correlation coefficients was applied to get the summary effects. Positive and significant relationships have been found (see Table 3) between all the associations of CQ with CCA, including their dimensions. Thus, the findings align with the proposed hypotheses for the study.

To answer the research questions, when CQ was measured as a whole construct, it had strong effects on CCA (overall) and interaction adjustment and moderate effects on general and work adjustment. Hence, among the three dimensions of CCA, interaction adjustment was greatly impacted by CQ (overall). The impact of CQ (overall) on general and work adjustments was somewhat similar. Furthermore, when individual CQs were taken into account, the effect of motivational CQ was strongest on CCA (overall), with other CQs (metacognitive, cognitive and behavioural) only moderately impacting CCA (overall). Lastly, when only the individual dimensions of both constructs were studied, the most substantial effect was found for the relationship of motivational CQ with interaction adjustment. In contrast, a comparatively weaker effect was found between behavioural CQ and work adjustment. Hence, out of all the relationships studied, the motivational aspect of CQ was found to be the most influential factor for CCA. Additionally, if we look at the overall results, CQ and all its individual components had moderate to strong effects on CCA and its dimensions, with behavioural CQ having a slightly lower effect on work adjustment. Other than its relationship with work adjustment, behavioural CQ had moderate effects on overall CCA and other adjustment dimensions. The weak, moderate and strong effect sizes indicate the practical significance or the observed effects between groups. Hence, a strong effect of motivational CQ suggests that its effect on CCA is pronounced and has vital practical significance. On the other hand, the comparatively weaker effect of behavioural CQ on work adjustment signifies that the observed effect of behavioural CQ on work adjustment is subtle and might not have a significant impact in practical applications. Our findings are partially consistent with the previous meta-analysis by Rockstuhl and Van Dyne (2018), where motivational CQ was strongly related to intercultural adaptation while behavioural CQ's relationship was insignificant with adaptation. Thus, it can be interpreted that people with high motivational CQ are intrinsically motivated and confident, and it is often observed in their dealings with host nationals. In contrast, behavioural CQ, which involves exhibiting new behavioural patterns suited to the new culture, might help people adjust to work in host nations a little. However, this effect may hold little practical relevance.

Furthermore, the present study also critically reviewed the studies included in the analysis and highlighted the typical methodological limitations of empirical research in cross-cultural studies. Four major methodological limitations related to sample, measurement and design of research are observed. The first limitation is the cross-sectional design of the studies. A cross-sectional design limits a researcher from making definitive causal statements as the findings are prone to be affected by situational factors. It is true, especially with CQ and CCA, as both these constructs tend to vary over time. Thus, measuring intelligence and adjustment at a single point in time will only mean that these characteristics are constant and do not change with time. However, as expatriates spend more time in host countries, their cross-cultural interaction and experience increase. Hence, we suggest pursuing expatriates over an extended time to measure if their intelligence and adjustment improve as time progresses. Therefore, it is recommended that future research in this area should use a longitudinal design to capture possible changes in employees' CQ and CCA.

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The second limitation is method bias, which arises when study variables are acquired from a single source and assessed by self-reported questionnaires. Such a method could lead to socially desirable responses and produce an inflated relationship between study variables. It could also be a problem while measuring expatriates' CQ and adjustment, where expatriates could rate their intelligence and adjustment more favourably than it is due to social desirability issues. The issue of favourable self-rating, thereby leading to a higher correlation between constructs, has also been highlighted in the previous meta-analyses (see Rockstuhl and Van Dyne, 2018; Schlaegel *et al.*, 2021). For instance, the correlations between CQ dimensions and outcome variables were found to be higher in studies that used self-reported questionnaires to collect responses than in studies that collected data from multiple sources (Rockstuhl and Van Dyne, 2018). Hence, future studies should devise measures that alleviate common method bias problems by collecting responses about expatriates' level of adjustment and intelligence from multiple sources like their spouses, peers and supervisors.

Another common limitation found in most studies reviewed is the generalisability of research results. Studies conducted in a specific context, like expatriates working in the same host country, or studies conducted on a particular sample, e.g., Nordic expatriates, often have a problem with results' generalisability. This is especially true in the case of a country's cultural characteristics, where some countries are easy to adjust to while some are not. Likewise, some host countries are culturally similar to the home country, while some are very distant. Thus, special caution should be taken while replicating a study's findings in other settings.

The last limitation is the relatively small sample size in a few studies. Hair *et al.* (1998), in their book on Multivariate Data Analysis, mentioned that small samples have too little statistical power to identify significant results. Thus, a larger sample enables rigorous analysis and enhances the validity and generalizability of the results. However, locating and obtaining expatriates' responses can sometimes be difficult, resulting in a lower response rate. In such cases, a meta-analysis becomes essential to understand how different variables are related.

5.1 Theoretical and practical implications

The findings of the meta-analysis have valuable theoretical and practical implications. The association between CQ and CCA has been extensively examined in the past literature, but results have been inconsistent when individual CQ dimensions were analysed (Lee *et al.*, 2014; Konanahalli *et al.*, 2014). By collating the findings of 30 studies, our study demonstrates that all four components of CQ are crucial for CCA. Moreover, our analysis also revealed that the inner drive and motive, i.e. motivational CQ, helps most while adjusting to new cultural settings. This finding lends support to the theories of motivation. Scholars and theorists can use this finding to propose or support motivation as a vital predictor of employee outcomes.

This research also has practical implications for management and individuals considering cross-cultural assignments. Since the results of the current meta-analysis showed the usefulness of CQ and all its dimensions in facilitating adjustment, the question of whether CQ could be taught and developed should be pondered by organisations. Considering the indispensability of the construct in cross-cultural settings, it would be a strong headway if organisations could help individuals develop CQ through training and interventions. Furthermore, when organisations select and train candidates for such assignments, efforts should be made to help them build their metacognitive and cognitive CQ by providing as much information about the new assignment as possible. In addition, organisations can offer networks and contacts of employees who are already on assignment abroad. Key achievements of previous and existing expatriates should be shared, and their contributions should be acknowledged. Sharing interesting and unique facts about the

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host country can also help employees strengthen their motivational CQ and actually inspire them to work on overseas assignments. In addition to this, providing specific cultural training and support for expected behaviour change in the new context could also be useful in developing behavioural CQ in employees. This is particularly important because, despite having the required cognitive capabilities and high motivation, employees may lack the ability to put their cognition and motivation into practice. This, in turn, may also impede their cultural integration. Thus, behavioural training is fundamental to the success of employees in cross-border assignments.

Our article also contributes to the literature by critically reviewing selected studies' methodological limitations and providing directions to future empirical research on CQ and CCA. Cross-cultural studies involve people living and working in different cultures, where some are culturally intelligent enough to adjust quickly while some take time to get along. Hence, studying only a limited sample at a single point in time, or generalising the results could highly impact the results. Since cultural issues work as an umbrella agent in cross-cultural studies, they are highly capable of overshadowing any other factor being studied. Thus, the limitations discussed above could be more detrimental to cross-cultural studies than to studies of another context.

5.2 Limitations and directions for future research

Every research is subject to certain limitations, which pave the way for future research. Our first limitation lies in the number of studies included in the research. Although a fair and exhaustive effort was made to include every relevant study, there are chances that an article or two might have been overlooked. Secondly, prior studies (e.g. Lee and Sukoco, 2010; Song *et al.*, 2023; Zhang and Oczkowski, 2016) have highlighted moderators' role, e.g. the cultural similarity or distance between the home and host nations and prior international experience in influencing CCA. However, due to insufficient studies on moderating effects in our sample, we could not check the moderators' impact. Therefore, with more empirical studies on CQ, it may be worth examining potential moderators' role in future studies. Besides, researchers in the area have also explored the roles of other types of intelligence, such as emotional and social intelligence, in relation to CQ, which we did not touch on in the current study. Future meta-analyses could check how these variables intertwine with CQ and affect the outcomes.

Furthermore, while every study included in our meta-analysis was conducted in a cross-cultural context, the studies had variability in sample characteristics. The different samples include expatriates, global professionals and international students. Future cross-cultural research could take this forward by doing a comparative analysis of how the peculiarities of different samples affect the CQ-CCA relationship. Also, none of the studies in our analysis used a sample of virtual workers. As virtual work arrangements have become more pervasive since the pandemic, it would be interesting to see how workers use their cultural knowledge and understanding when interacting with people online. It would also be worth checking if virtual workers' adjustments are any different from physical adjustments and how the construct "adjustment" can be conceptualised for virtual cross-cultural interactions.

The next limitation lies in the critical review of selected research articles included in the review. We want to mention that our contending to critiques revolve more around the research methodology used in a study, such as sample, research design and measurement characteristics. The studies had several other limitations relating to other variables and methods used in their research, which we did not mention in the analysis. Therefore, careful analysis of each study is recommended before reaching any conclusion.

Lastly, notwithstanding that motivational CQ resulted in having the most substantial effect on CCA, its worthiness has been questioned, with researchers believing that being motivated in cross-cultural interactions is not essential for CQ (Thomas *et al.*, 2015).

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The motivational aspect is, in fact, excluded from the popular SFCQ (Short-Form measurement of Cultural Intelligence) measure (Fang *et al.*, 2018; Thomas *et al.*, 2015). While motivational CQ emerged as the most influential factor not only in this study but also in previous meta-analyses by Rockstuhl and Van Dyne (2018) and Schlaegel *et al.* (2021), we believe it is up to the global mobility researchers to decide how they want to go ahead with CQ research.

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