

Cultural intelligence, global mindset, and cross-cultural competencies: a systematic review using bibliometric methods

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Abstract: We conducted a systematic review of 158 publications on Cultural Intelligence (CQ) and related concepts, Global Mindset (GM), and Cross-cultural Competence (CC) using bibliometric methods. We apply citation analysis to highlight the most influential (in terms of citations) journals, publications, and specific researchers in the field. We apply factor and cluster analyses to analyse co-citations to identify the current knowledge structure in the research field. With content coding on the resulting groups of co-citations, we identify five research streams showing the overlap between the CQ, GM,

and CC constructs, and also revealing the separations in the research on the constructs. We perform burst analyses to identify trends and emerging topics or streams. Building on this, we outline future research opportunities.

Keywords: cultural intelligence; global mindset; cross-cultural competence; bibliometric methods; citation analysis; co-citation analysis; burst analysis; content analysis.

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1 Introduction

Cultural Intelligence (CQ) is the ability to succeed in a cross-cultural environment and comprises several dimensions, including cognitive, metacognitive, motivational, and behavioural CQ (Ang and Van Dyne, 2008a). It stems from cross-cultural psychology yet has attracted strong interest in the field of international business and management (e.g., Johnson et al., 2006). Empirical research shows that it reliably predicts outcomes

such as global leadership (e.g., Sutton et al., 2013), negotiation performance (e.g., Imai and Gelfand, 2010), expatriation intention (e.g., Richter et al., 2019) (forthcoming), and job performance (e.g., Ang et al., 2007). Furthermore, a number of journals have published special issues on CQ (e.g., Chiu et al., 2013), and there are already several review articles on the concept (e.g., Ott and Michailova, 2018; Fang et al., 2018).

Review studies address the definition of CQ in contrast to the more traditional international business terminology (e.g., Andresen and Bergdolt, 2017; Levy et al., 2007; Johnson et al., 2006). Moreover, the authors have reviewed the literature with a focus on structuring (empirical) studies based on CQ (Fang et al., 2018; Ott and Michailova, 2018). Ott and Michailova (2018) presented an overview of studies that refer to the concept as an antecedent, moderator, or mediator in relation to different outcomes, such as leadership, performance, and effectiveness. They also present an overview of antecedents to CQ, such as cultural exposure and cross-cultural training. Their review refers to 73 conceptual and empirical publications published from 2002 to 2015 in management, international business, education, and psychology journals that fulfil certain rankings (appearance on the ABS list, rank C or above in the ABDC ranking) (Ott and Michailova, 2018). Fang et al. (2018) reviewed empirical research (142 publications) on CQ, building on a keyword search in the Web of Science (WoS) database (keyword: CQ in the topic or title, excluding, among others, articles in anthropology, biology, and medicine). Fang et al. (2018) also discuss different measurement scales and offer an overview of antecedents, including articles that focus on means to develop CQ, direct and indirect effects of CQ on various outcomes in quantitative studies, and qualitative research into CQ. Finally, they discuss studies that look at CQ at an aggregate level (Fang et al., 2018). Moreover, there are the first meta-analyses done on the different work-related outcomes of CQ (Rockstuhl and Van Dyne, 2018; Schlaegel et al., 2017). These reviews draw an excellent picture of the research completed and indicate that the topic of CQ in international business and management is no longer in a nascent phase, but in a growth phase, with an evolving scientific community (see von Krogh et al., 2012).

In addition to CQ, there are two concepts with a longer research history in international business and management: Cross-cultural Competencies (CC) and Global Mindset (GM) (e.g., Andresen and Bergdolt, 2017; Elo et al., 2015; Leung et al., 2014; Bückner and Poutsma, 2010a). While these concepts are not identical to CQ, they are valuable when looking at the CQ research domain for two reasons: first, they have relevant overlap with the concept of CQ (see Appendix 1 for a brief overview of selected measurement approaches). Second, they are used for the same purpose in international business and management, namely to understand and explain diverse outcome variables such as those mentioned above. However, reviews of empirical research only concentrate on one of the concepts – the above on CQ (and others on GM and CC, see Javidan and Bowen, 2013; Levy et al., 2007). This may be cumbersome due to the overlap involved and we see potential in gaining further insight through combining the existing knowledge on shared and distinct facets of each construct. The early research goes in this direction, such as the recent study by Andresen and Bergdolt (2019) empirically combining CQ with GM, and Johnson et al. (2006) who suggest that CQ plays an important role in the development of CC.

In this vein, we complement past reviews and broaden the focus: we systematically review the literature using bibliometric methods and include concepts that are strongly related to CQ, namely GM and CC. Relying on bibliometric methods, we offer an objective and reproducible approach to assessing the current state of the literature (see Belter, 2015). We seek to contribute to a better understanding of the intellectual

structure of research on the three constructs and their effects on different outcomes. Since each concept is ultimately used to explain different outcomes in international business (at the individual, group or team, and organisational levels), there is a value in understanding: a) the intellectual structure of the literature around CQ, CC, and GM; b) the diffusion of the different concepts throughout the research literature, and; c) the structure of the scientific community. We believe that there is value in further integrating research into the three concepts as each can be informed by the other, and knowledge spillovers in research may help to further resolve the existing conflicts in explaining the performance outcomes of international business and management phenomena. This should help in developing a potential joint future research agenda to advance theorising in international business and management.

Ultimately, this will answer the following questions: (1) *Which journals, publications, and specific researchers are the most influential in CQ, GM, and CC research?* (2) *What is the intellectual structure of the CQ, GM, and CC literatures, including key research streams and potentially bridging researchers in the field?* (3) *What is the temporal evolution of research streams in CQ, GM, and CC research and what are the emerging topics?* (4) *What are the promising routes for future research?*

2 Concepts, data, and methods

2.1 Concepts studied: CQ, GM, and CC

There is a lack of consensus on the terms, similarities, distinct features, and associations of CQ, GM, and CC. We demonstrate this below with reference to conceptual papers that seek accepted definitions: Andresen and Bergdolt (2017) presented a systematic review of the definitions of CQ and GM (that also incorporates studies in a similar vein, such as Levy et al. (2007), who define GM on individual, group, and organisational levels). Johnson et al. (2006), Spitzberg and Chagnon (2009), as well as Leung et al. (2014) proposed definitions and models of CC.

We define CQ as the ability to succeed in complex cross-cultural environments through knowledge or cognition, motivation, and behaviours. This definition is based on the review by Andresen and Bergdolt (2017), who compare seven definitions and conceptualisations of CQ. All the publications they reviewed identify a cognitive dimension, with six out of seven suggesting that resources to adapt behaviour are an integral part of CQ, and four out of seven refer to the motivational component (Andresen and Bergdolt, 2017). We next refer to Ang and Van Dyne (2008a) and Earley and Ang (2003) and summarise as follows: Cognitive CQ represents the general knowledge and knowledge structures about culture. Metacognitive CQ reflects the mental capability of individuals to acquire and understand cultural knowledge. Motivational CQ is an individual's capability to direct energy towards learning about and functioning in different intercultural situations. Finally, behavioural CQ describes an individual's capability to exhibit appropriate actions in culturally diverse encounters (Ang and Van Dyne, 2008a; Earley and Ang, 2003). Andresen and Bergdolt (2017) find that a certain degree of CQ is a necessary precondition for acquiring a GM that enables successful international business relationships. Johnson et al. (2006) stated that CQ has a key role in the development of CC, and that CQ relates to CC, which in turn relates to failure or success in international business.

We define GM “as the capacity to function effectively within environments characterized by high cultural and business complexity” (Andresen and Bergdolt, 2017, p.183). To function effectively in these environments, individuals need to have personal attributes of openness and cosmopolitanism (in addition to cognitive and motivational facets). Andresen and Bergdolt (2017) concluded that GM goes beyond CQ since it allows managers or employees to identify successful strategic actions needed in a global context. Similarly, Javidan et al. (2016) defined GM as a set of individual self-efficacies that affect a global leader’s ability to influence others in a complex, interdependent, ambiguous, and constantly changing global world. While both GM and CQ resemble each other, a GM more specifically addresses successfully coping with global management and leadership challenges in addition to *just* being culturally intelligent, at least when following what Andresen and Bergdolt (2017) summarise in their review.

Following the review of CC definitions in international business by Johnson et al. (2006), we define CC as “an individual’s effectiveness in drawing upon a set of knowledge, skills, and personal attributes in order to work successfully with people from different national cultural backgrounds.” (Johnson et al., 2006, p.530). Most authors define CC as similar to CQ: the ability to effectively function in diverse cultural settings. Gertsen (1990) discusses three interdependent dimensions that make up CC: an affective dimension (personality traits and attitudes), a cognitive dimension (how individuals acquire and categorise cultural knowledge), and a communicative dimension (being an effective communicator). In contrast to CQ, CC involves personality traits and a focus on communication (although there is some overlap with the behavioural CQ dimension). Leung et al. (2014) presented a general framework of CC that views GM and CQ as forms of CC, using CC as an umbrella term for the other two. In their model, capabilities related to CQ are determined by traits and attitudes. Traits and attitudes are part of GM that additionally comprises capabilities (see also Appendix 1 for an overview of content domains of selected measurement instruments, adapted from Leung et al., 2014).

Pinpointing the distinct features of each concept and the potential associations between them is ambiguous. Although broadly accepted terminologies are desirable, including recognising distinct and overlapping characteristics as well as the causal ordering of concepts (e.g., Spitzberg and Chagnon, 2009; Levy et al., 2007), we note that recent attempts to do so have not fully accomplished this goal. Still, we believe that the above overviews provide a good first indication.

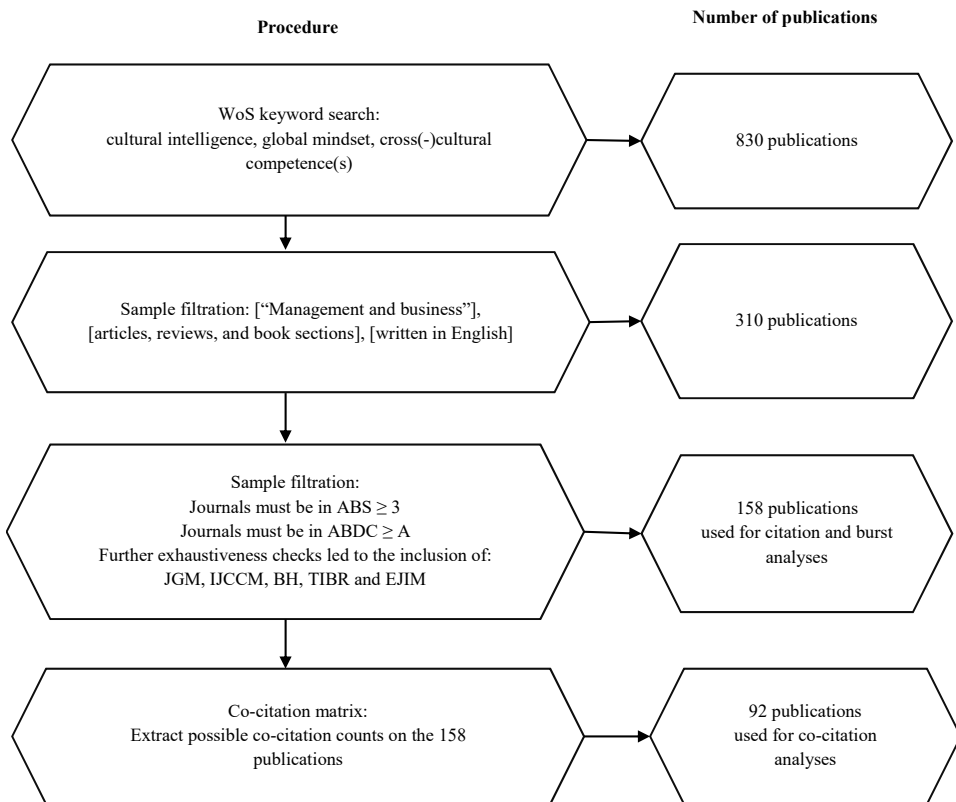
2.2 The database and collection of publications

To perform our analyses, we first selected the appropriate publications using the WoS database by Clarivate Analytics, for three reasons: first, it is well recognised and most authors performing bibliometric analyses use it (e.g., Fetscherin and Heinrich, 2015; Collinson and Rugman, 2010). Second, recent reviews comparing different databases demonstrate that it has good coverage of publications, comparable to Scopus – another popular database used for bibliometric purposes (e.g., Harzing and Alakangas, 2016). Third, it was designed to satisfy the users of citation analysis and is therefore compatible with most tools for citation analyses (e.g., Harzing and Alakangas, 2016).

In the second step (see Figure 1), we chose keywords: CQ, GM, and CC. This search also refers to different abbreviations of these terms, their plurals, and different ways of spelling, resulting in 830 publications. We filtered this collection for English publications in management and business. We also filtered for research published in journals that meet certain minimum rankings (for a similar procedure, see García-Lillo et al., 2017)

which is advantageous with regards to ensuring a sufficient number of co-citations for the later analyses. Further checks of the resulting journal list showed that this list was not sufficiently exhaustive to permit a comprehensive review. Evaluating further outlets with the help of three experts in the field of CQ and along the number of articles published, we added more journals to the list (see Figure 1). This process was designed to achieve a collection of publications with the potential to make strong research contributions and generate citations, which is our primary unit of analysis. Publications that generated few or no citations are problematic in bibliometric analyses since they inflate the collection of publications retrieved without contributing to the analyses. For instance, they may bias the intended clustering of publications or may result in many small clusters of research with few publications or even only one. We also included two seminal books on CQ (Earley and Ang, 2003; Ang and Van Dyne, 2008b) as external references to our sample (see Boyack and Klavans, 2010) due to a high number of co-citations identified for the two sources. The filtering process led to the final retrieved collection of 158 publications.

Figure 1 Procedure and results of sample extraction



Notes: JGM = *Journal of Global Mobility*, IJCCM = *International Journal of Cross-Cultural Management*, BH = *Business Horizons*, and TIBR = *Thunderbird International Review*, EJIM = *European Journal of International Management*

For a final correction of the extracted citation data (e.g., checking for duplicates, spelling of author names), we used several software packages that prepared the collection for the different purposes: citation analysis, co-citation analysis, and burst analysis. For the

citation and burst analyses, we used HistCite, the R-package Bibliometrix (Aria and Cuccurullo, 2017) with the default script included in the package, and Sci2 (science of science). For the co-citation analysis, we used Bibexcel (Persson et al., 2009) to check for spelling errors, incorrect author names, and duplicates (Cobo et al., 2011) and used the default functions provided. Finally, we manually checked the files to ensure there were no duplicates in the analyses.

2.3 Bibliometric citation analysis

We performed a bibliometric citation analysis using HistCite on our retrieved collection of 158 publications and their number of citations. Bibliometric citation analysis has become popular in many fields in the past few years (e.g., Chatterjee and Sahasranamam, 2018; Apriliyanti and Alon, 2017; White et al., 2016; Fetscherin and Heinrich, 2015; Collinson and Rugman, 2010) as it estimates the influence of publications (or documents), authors, and journals via citation rates. In this context, citations are viewed as a measure of influence or impact. If a publication or an author is heavily cited, it or they will be considered important or popular (e.g., Zupic and Cater, 2015; Kim and McMillan, 2008).

We obtained bibliometric citation data in the forms of Local Citations (LCS) and Global Citations (GCS). LCS is the number of times a publication is cited by others in our collection of 158 publications. GCS is the number of times a publication is cited in WoS databases and within the retrieved collection (Apriliyanti and Alon, 2017). We also used HistCite to compute LCS and GCS for the two external seminal books. Using these scores, we identify the most influential publications, the most prolific authors, and the most influential journals.

2.4 Bibliometric co-citation analysis

We performed a co-citation analysis on publications to understand the intellectual structure of the research into CQ, GM, and CC (see Zupic and Cater, 2015). The analysis uses co-citation counts, i.e., the number of times two publications are cited together by others. This is regarded as a measure of similarity based on the assumption that the more often two publications are cited together, the more likely their content is related (Small, 1973). Thus, co-citation analysis is a useful tool to identify streams of thought or shared research interests (Zupic and Cater, 2015; Pasadeos et al., 1998). We used Bibexcel to extract the number of co-citations for the publications in our retrieved collection. Of the 158 publications, 92 showed co-citations and were extracted in the form of a co-citation square matrix (an overview of detailed steps when using Bibexcel is provided from the corresponding author upon request). The co-citation square matrix produced in Bibexcel includes the raw counts of co-citations and was loaded into SPSS. We transformed this matrix into a correlation matrix using Pearson's r , as this is an advantageous normalisation for the upcoming cluster and factor analyses (see Di Stefano et al., 2012; Reader and Watkins, 2006).

To find intellectual streams, we performed exploratory factor and cluster analyses, which allow for a comparison and reliability check of results (see Samiee and Chabowski, 2012). We first applied an exploratory factor analysis using principal component analyses (most common in bibliometric analyses, see Zupic and Cater, 2015). We referred to the eigenvalues and the scree plot for determining the number of factors.

We used varimax rotation to ease the interpretation of results (e.g., Di Stefano et al., 2012; Reader and Watkins, 2006) which produced results similar to an oblimin rotation in our case (as preferred by Samiee and Chabowski (2012)). To interpret the assignment of publications to factors or intellectual streams, we used a threshold for factor loadings at ± 0.50 (as did Samiee and Chabowski, 2012; Reader and Watkins, 2006). While the factor analysis led to nine factors (with a total explained variance of 94.80%), the analysis of loadings shows that no publication specifically loaded on factor 9, providing us with eight factors to be analysed further. Second, we used cluster analyses on the correlation matrix of co-citations. We employed the most common protocol of first applying a hierarchical, connectivity-based clustering method, Ward, followed by a centroid-based cluster procedure, *k*-means (Mooi and Sarstedt, 2011). Ward’s method helped us determine the appropriate number of clusters and the related agglomeration schedule (based on squared Euclidean distances) pointed to eight or nine clusters. In combination with the factor analysis results, we decided on an eight-cluster solution. In the next step, we applied the *k*-means cluster procedure to specify the best assignment of publications to the eight clusters (see Mooi and Sarstedt, 2011). Table 1 gives an overview of the assignment of publications to clusters from both the factor and cluster analyses. The eight factors are numbered from 1 to 8 and the clusters are labelled from A to H to avoid confusion. We note that two publications were not loaded under a factor due to their factor loadings, but are clustered under F and H. The total number of publications assigned was 92.

Table 1 Overview of assignment to clusters from factor and cluster analysis

Cluster										Total
Factor	A	B	C	D	E	F	G	H		
1	40	10	7	2					59	
2				9					9	
3					11	1			12	
4						2			2	
5							3		3	
6								1	1	
7					2				2	
8						2			2	
-						1		1	2	
Total	40	10	7	11	13	6	3	2	92	

As Table 1 demonstrates, both analyses are strongly in line and confirm a basic structure of research clusters. For interpretative purposes, we concentrated on the clusters confirmed by both procedures that showed a meaningful size (10% of publications in a cluster). We decided to include cluster C, which has seven publications, due to its very clear assignment to one group in the cluster analysis. Thus, we concentrated on: 1A with 40 publications, 1B with 10 publications, 1C with seven publications, 2D with nine publications, and 3E with 11 publications. We are confident that these 77 (of the 92) publications provide a good overview of the research streams. For the 15 publications not unambiguously grouped into a coherent group, we pursued the following strategy: If they were neither among the top-cited publications nor received more than 20 co-citations, we excluded them from further analysis.

2.5 Code frame development and manual coding based on computer-aided text analysis

To understand the meaning of the intellectual streams emerging from the multivariate analyses, we transferred all publications along with their cluster assignment to NVivo (e.g., Leech and Onwuegbuzie, 2011; Bazeley, 2002). In NVivo, we performed an automatic count of keywords and used the word-tree function on the full publications (as a tool of computer-aided text analysis/CATA, see Gaur and Kumar, 2018). In combination with previous literature reviews (e.g., Fang et al., 2018; Ott and Michailova, 2018; Andresen and Bergdolt, 2017) and a careful reading of the publications, we developed a code frame for manual coding. Hence, we combined automated procedures with manual coding to achieve the highest level of objectivity while being able to structure content into meaningful categories.

We coded all publications along their core research areas into seven broad themes: (1) *Concept, stages, measurement* was assigned to all publications that either introduce one of the concepts of CQ, GM, or CC, or conceptually discuss or empirically validate the concepts and their measurements. (2) *Antecedents* was assigned to all publications that look at the antecedents of CQ, GM, or CC either empirically or conceptually; these antecedents comprise, for instance, personality, international exposure, language abilities. One antecedent received a separate code, namely learning. Publications that look into how training can influence CQ, GM, and CC and at the forms of training or learning and learning contexts received the code (3) *Learning* (see likewise, Fang et al., 2018). We coded *outcomes* into three levels: the first was (4) *Individual-level outcomes*, which was assigned to all publications on outcomes at the individual level of analysis. Subthemes centre around different performance types (job, task, leadership, and expatriation) and also discuss expatriation intention, adjustment, and job satisfaction. The second code was (5) *Group-level outcomes*, as knowledge sharing in teams, team performance, collaboration, trust, acceptance in groups, and negotiations. The third code was (6) *Organisational-level outcomes*, for all publications that examine organisational outcomes from internationalisation processes, firm performance effects, and outcomes at the level of business functions such as marketing (innovation, marketing mix adaptation), and human resources (organisational turnover, employee commitment, human resource success). Some of these HR outcomes show an overlap between the organisational and individual level, hence we implemented a double coding under two categories yet proposed a lead or primary category. If a publication analyses both antecedents and outcomes, we coded it primarily along the outcomes it looks at. Review studies (i.e., publications with the primary objective of conducting a structured or unstructured review of the literature and field) are not further coded along themes but receive the code (7) *Review*.

For the coding, we followed standard procedures in the field (e.g., Richter et al., 2016b), such as testing the code frame on a sub-collection of publications and engaging in open coding to enrich the code frame when necessary. Coding was done by two of the authors independently from each other. Thus, coding was done by coders with in-depth knowledge of the field. Conflicts were discussed and addressed (Leech and Onwuegbuzie, 2011). Intercoder reliability was calculated using Cohen's kappa (Cohen, 1960). The overall intercoder reliability between the two coders is 0.813, which is within the upper level of "perfect agreement" (McHugh, 2012).

2.6 Burst analysis

Across a period of years, research topics may weave in and out of popularity. One technique for measuring the appeal of a topic in research literature over time is Kleinberg's (2003) burst detection algorithm, which is well recognised on different fields using bibliometric methods (e.g., Khan et al., 2019; Zhu et al., 2019; Chen et al., 2018; Song et al., 2016; Guo et al., 2011). We applied this algorithm to identify emerging topics and radical changes or sharp increases in interest in a specific topic – called the burst – over time (e.g., Zhu et al., 2019). Researchers may look at different kinds of time-stamped text to run the algorithm, including titles, abstracts, and keywords published with the manuscript in a certain year. Running the algorithm for a certain time period, researchers can identify words in titles, abstracts, and keywords that reflect sudden usage increases. The algorithm then outputs a list of these words together with the beginning and end of the burst, as well as the burst strength (also called weight), to indicate the change in usage frequency (e.g., Guo et al., 2011; Kleinberg, 2003).

Two authors reviewed these lists and selected words relevant to our study, resulting in 38 keywords. We compared the words from the algorithm with the keywords by means of the CATA performed for the co-citation clusters and our code frame. As a result, we identified a list of terms which we structured along our code frame to facilitate readability. For some of the keywords, coding them into different categories would have been possible. For instance, a burst for the word *performance* in 2013 is twice related to organisations yet related one time to expatriates in organisations (see Table 6). In this and other cases, we structured it along the dominant context, here the organisational one. To make this transparent, we integrated an overview of the context in which the respective keyword was used in the manuscript.

3 The most influential publications, authors, and journals

3.1 The most influential publications

Table 2 shows the most cited publications based on the number of local citations, the LCS. It demonstrates a strong focus on CQ with 11 out of 14 publications focusing on CQ. Conceptualisations were found in particular: for instance, the most cited publication is the handbook by Earley and Ang (2003) (LCS: 84; GCS: 801). It is one of the earliest publications that focused on the development of the concept along with theoretical reviews and a discussion of measurements. The publication by Ang et al. (2007) (LCS: 74; GCS: 487) ranks second and focuses on the validation of the then newly developed cultural intelligence scale (CQS). Similarly, the study by Ang et al. (2006) (LCS: 37; GCS: 229 and rank 5) discussed the discriminant validity of the four-factor model of CQ and laid the groundwork for all authors aiming to empirically use the CQ model. Earley and Peterson (2004) are third most cited (LCS: 44; GCS: 224) and focused on CQ and its implications on training and global work assignments. Likewise, Ng et al. (2009) (LCS: 40; GCS: 179 and rank 4) present CQ as a moderator in the relationship between experiential learning and global leadership self-efficacy. GM and CC come into the ranking in the form of review articles, i.e., the review by Johnson et al. (2006) on CC (LCS: 31; GCS: 261) and the review by Levy et al. (2007) on GM (LCS: 25; GCS: 268).

Table 2 Ranking of top publications along LCS (and GCS)

<i>LCS Rank</i>	<i>GCS Rank</i>	<i>Publication</i>	<i>Title</i>	<i>Source</i>	<i>LCS</i>	<i>GCS</i>
1	1	Earley and Ang (2003)	Cultural intelligence: individual interactions across cultures	Stanford University Press	84	801
2	3	Ang et al. (2007)	Cultural intelligence: its measurement and effects on cultural judgement and decision-making, cultural adaptation and task performance	<i>Management and Organisation Review</i>	74	487
3	8	Earley and Peterson (2004)	The elusive cultural chameleon: cultural intelligence as a new approach to intercultural training for the global manager	<i>Academy of Management Learning and Education</i>	44	224
4	10	Ng et al. (2009)	From experience to experiential learning: cultural intelligence as a learning capability for global leader development	<i>Academy of Management Learning and Education</i>	40	179
5	7	Ang et al. (2006)	Personality correlates of the four-factor model of cultural intelligence	<i>Group and Organisation Management</i>	37	229
6	12	Templer et al. (2006)	Motivational cultural intelligence, realistic job preview, realistic living conditions preview, and cross-cultural adjustment	<i>Group and Organisation Management</i>	32	158
7	5	Johnson et al. (2006)	Cross-cultural competence in international business: towards a definition and a model	<i>Journal of International Business Studies</i>	31	261
8	4	Levy et al. (2007)	What we talk about when we talk about 'global mindset': managerial cognition in multinational corporations	<i>Journal of International Business Studies</i>	25	268
8	11	Earley and Mosakowski (2004)	Cultural intelligence	<i>Harvard Business Review</i>	25	178
9	13	Thomas (2006)	Domain and development of cultural intelligence – the importance of mindfulness	<i>Group and Organisation Management</i>	24	155
9	14	Imai and Gelfand (2010)	The culturally intelligent negotiator: the impact of cultural intelligence (CQ) on negotiation sequences and outcomes	<i>Organisational Behaviour and Human Decision Processes</i>	24	119
10	9	Gupta and Govindarajan (2002)	Cultivating a global mindset	<i>Academy of Management Executive</i>	22	219
11	2	Ang and Van Dyne (2008b)	Handbook of cultural intelligence: theory, measurement, and applications	ME Sharpe	21	609
12	6	Shaffer et al. (2006)	You can take it with you: individual differences and expatriate effectiveness	<i>Journal of Applied Psychology</i>	17	244

Table 2 also shows an overview of the top 14 most cited publications, based on the number of global citations, the GCS. The publications in the two lists are identical; however the ranking changes when looking at the GCS. The most obvious difference is the one found for the publication by Ang and Van Dyne (2008a), which is the second most globally cited publication (though ranked 11th along the LCS). The two review publications by Levy et al. (2007) and Johnson et al. (2006) are also higher ranked along the GCS.

3.2 *The most prolific authors*

There were a total of 375 authors with articles in the 158 publications: 19 publications have a single author, and 362 authors belong to one or more co-authored publications. Table 3 presents the most prolific authors in CQ, GM, and CC research from 1999 to 2018. We present all authors with their affiliation, country, number of publications, and a weighted score for their co-authorships. Country of origin was measured along the corresponding authors of each publication (which is one way to measure country of origin). As per White et al. (2016), we calculated a weighted score based on the authorship for the total number of publications: single authors receive a score of 1, authors with only one co-author receive 1/2, authors with two co-authors receive a score of 1/3, etc. We present the top 15 authors in terms of the weighted score in Table 3.

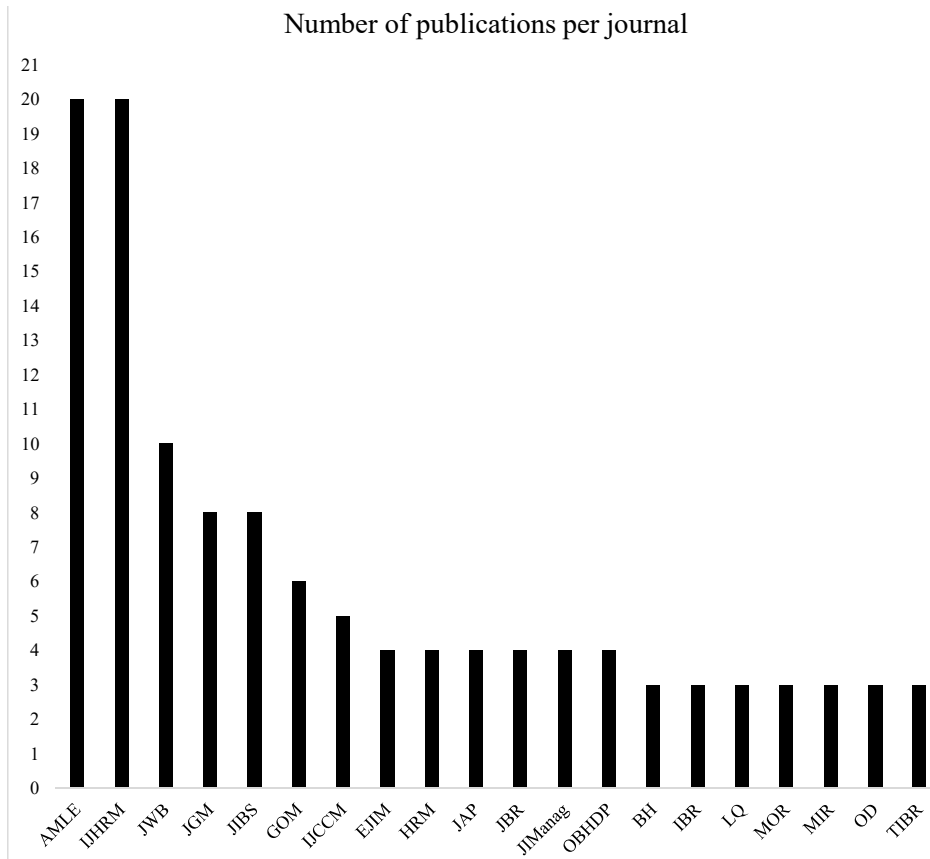
Table 3 The most prolific authors between 1999 and 2018

<i>Author name</i>	<i>Author affiliation</i>	<i>Country</i>	<i>No. of publications</i>	<i>Weighted score</i>
Soon Ang	Nanyang Technological University	Singapore	8	2.84
Christopher P. Earley	University of Technology Sydney	Australia	5	2.83
Alfred Presbitero	Deakin University	Australia	3	2.50
Joost J.L.E. Bueker	Radboud University	Netherlands	6	2.42
Linn Van Dyne	Michigan State University	USA	4	2.01
Snejina Michailova	University of Auckland	New Zealand	4	1.75
Dana L. Ott	University of Otago	New Zealand	3	1.50
Kok Yee Ng	Nanyang Technological University	Singapore	4	1.18
Tomasz Lenartowicz	Florida Atlantic University	USA	3	1.17
Susan Freemann	University of South Australia	Australia	3	1.03
Melanie P. Lorenz	Florida Atlantic University	USA	3	1.03
Jase R. Ramsey	Saint Louis University	USA	3	1.03
Jose Augusto Felicio	Technical University of Lisbon	Portugal	3	1.00
Olivier Furrer	University of Fribourg	Switzerland	3	0.92
Günter K. Stahl	Vienna University	Austria	3	0.91

3.3 The most influential journals

The publications come from 47 different sources, published between 1999 and 2018, with a strong uptick of publications in recent years (especially from 2013). Figure 2 depicts the distribution of publications across journals, and Figure 3 depicts the development of publications over time. Table 4 gives an overview of the number of publications per journal, the LCS, and the GCS, as well as the LCS and GCS per year.

Figure 2 Number of publications per journal



Notes: AMLE = *Academy of Management Learning and Education*; IJHRM = *International Journal of Human Resource Management*; JWB = *Journal of World Business*; JGM = *Journal of Global Mobility*; JIBS = *Journal of International Business*; GOM = *Group and Organisation Management*; IJCCM = *International Journal of Cross Cultural Management*; EJIM = *European Journal of International Management*; HRM = *Human Resource Management*; JAP = *Journal of Applied Psychology*; JBR = *Journal of Business Research*; JIManag = *Journal of International Management*; OBHDP = *Organisational Behaviour and Human Decision Processes*; BH = *Business Horizons*; IBR = *International Business Review*; LQ = *Leadership Quarterly*; MOR = *Management and Organisation Review*; MIR = *Management International Review*; OD = *Organisational Dynamics*; TIBR = *Thunderbird International Review*

Figure 3 Development of publications over time

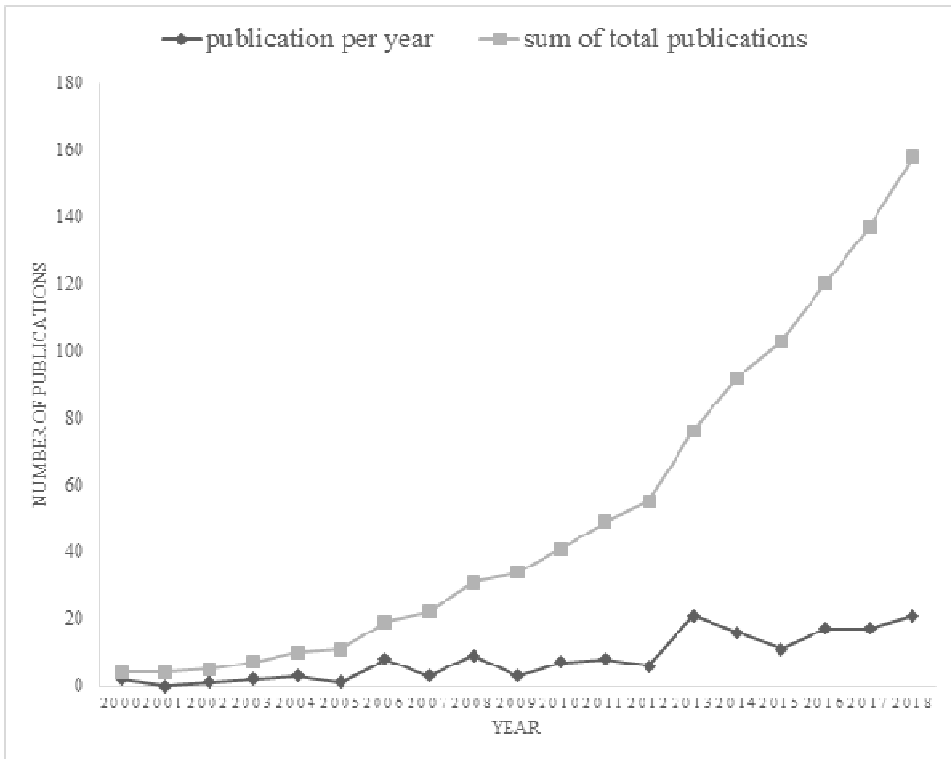


Table 4 The number of publications per journal between 1999 and 2018

Journal	Subject*	No. of publications	LCS Rank [†]	LCS yearly	Rank [†]	GCS	Rank [†]	GCS yearly	Rank [†]
<i>Academy of Management Learning and Education</i>	General and Strategy	20	163	1	21.60	1	972	1	131.35
<i>International Journal of Human Resource Management</i>	HRM / IB	20	45	7	7.62	4	446	8	79.34
<i>Journal of World Business</i>	IB	10	49	6	5.89	6	472	7	63.31
<i>Journal of Global Mobility-The Home of Expatriate Management Research</i>	HRM	8	3	19	1.17	19	19	29	8.33

Table 4 The number of publications per journal between 1999 and 2018 (continued)

<i>Journal</i>	<i>Subject*</i>	<i>No. of publications</i>	<i>LCS Rank†</i>	<i>LCS Rank†</i>	<i>LCS yearly Rank†</i>	<i>GCS Rank†</i>	<i>GCS Rank†</i>	<i>GCS yearly Rank†</i>	<i>GCS Rank†</i>	
<i>Journal of International Business Studies</i>	IB	8	75	5	8.24	3	806	2	75.88	3
<i>Group and Organisation Management</i>	Organisation /HRM	6	130	2	11.22	2	720	4	59.90	6
<i>International Journal of Cross-Cultural Management</i>	Organisation /HRM	5	5	18	1.25	18	17	31	5.33	28
<i>European Journal of International Management</i>	IB	4	0	22	0.00	27	10	35	1.75	40
<i>Human Resource Management</i>	Organisation /HRM	4	13	14	1.91	11	139	13	17.97	11
<i>Journal of Applied Psychology</i>	Psychology	4	35	9	4.31	9	371	9	40.18	8
<i>Journal of Business Research</i>	Marketing	4	2	20	0.50	22	28	26	10.42	20
<i>Journal of International Management</i>	IB	4	2	20	0.33	25	54	19	9.25	22
<i>Organisational behaviour and Human Decision Processes</i>	Organisation /HRM	4	40	8	4.95	8	203	11	26.20	10
Averages (total database)		3.16	17.5		2.01		151.26		17.25	

Note: *According to Anne-Wil Harzing's journal quality list (www.harzing.com);
†relative rank among each of the 47 journals in the sample.

We refer to the number of publications as a proxy of the output by each journal on CQ, GM, and CC. The three highest-output journals are: *Academy of Management Learning and Education* (N = 20), *International Journal of Human Resource Management* (N = 20), and *Journal of World Business* (N = 10). We concentrate on the GCS per year to determine whether the high-output journals are also influential in the field. In terms

of GCS per year, the ranking differs slightly: *Academy of Management Learning and Education* (GCS yearly: 131.35) and *International Journal of Human Resource Management* (GCS yearly: 79.34) remained at the top of the list. Third highest along the GCS per year is *Journal of International Business Studies* (GCS yearly: 75.88 GCS), though slightly before *Journal of World Business* (GCS yearly: 63.31 GCS).

4 Current and emerging intellectual streams

4.1 Co-citation clusters and their main research themes

Table 5 gives an overview of the factors and clusters derived from the co-citation analysis, and lists their publications and core research themes. These factors or sub-clusters form intellectual streams that we labelled as follows: 1A) 'The CQ construct and its implementation into the literature' (with 40 publications), 1B) 'Knowledge management cross-cited over constructs' (with 10 publications), 1C) 'CQ, leadership and social interaction' (with 7 publications), 2D) 'CQ and international exposure' (with 9 publications), and 3E) 'Research involving the GM construct' (with 11 publications).

The overwhelming majority of publications that form intellectual stream 1A relate to CQ as the core concept and there are 13 out of the 40 publications in this stream that relate to the concept itself, stage models, or measurement aspects of CQ. These publications are at the heart of the CQ conceptualisation and its implementation into the literature or field. It was less obvious to label the intellectual streams 1B and 1C. Therefore, we made use of word trees and word frequency counts using NVivo for these groups of publications which provided a focus on 'leadership' and 'social groups /relationships /experiences /interactions /dominance' for intellectual stream 1C. The intellectual stream 1B showed a focus on knowledge management (i.e., knowledge creation and knowledge transfer). This latter stream is also interesting, as it demonstrates a mixture of concepts involved: there seems to be a knowledge transfer or at least cross-consideration visible in the co-citations in the sense that studies often include more than one concept (cf. Ramsey and Lorenz, 2016). Stream 2D again focuses on CQ as the core concept and concentrates on examining its associations with international exposure. The 11 publications in stream 3E differentiate from the others by almost fully focusing on GM.

Analysing the common and distinct research areas in the different streams using our coding scheme and the more quantitative analyses, we outlined the following observations. First, there is an overlap of research areas. Even if the constructs have emerged separately, their underlying similarities have spawned a surge of similar research themes, which in turn has led to the emergence of closely-related literature. However, this literature often remains separated along the constructs. For instance, studies on individual-level outcomes examine the effects of CQ (Lee and Sukoco, 2010) and CC (Shaffer et al., 2006) on expatriate effectiveness separately. However, there is no study that has compared the effects of the two constructs on expatriate effectiveness.

Table 5 Overview of clusters

Clusters	<i>Core research</i>	<i>Core concept</i>	<i>Theme (author)</i> <i>Sequencing from older to newer</i>	
The CQ construct and its implementation into the literature (1A: 40)			A handbook of CQ introducing its definition, conceptualisations, dimensions, measurements, training as well as demonstrating the usage of the construct to understand intercultural encounters in organisations (Earley and Ang, 2003; see org-level outcome and learning) *	
			The CQ concept, its measurement, profiling and training options in a manuscript targeted towards business people and managers (Earley and Mosakowski, 2004)	
			A commentary outlining CQ as an alternative concept for future cross-cultural research (Earley, 2006)	
			Conceptualising on a culturally intelligent model of team collaboration intended to enhance creative and realistic decision-making (Janssens and Brett, 2006; see group-level outcome) *	
			A definition of CQ that explicitly introduces mindfulness as a key component (Thomas, 2006)	
			In a vein to enhance the theoretical precision of the CQ concept, the authors cross-validate the CQ scale and introduce a model that links CQ to intercultural effectiveness outcomes (Ang et al., 2007; see individual-level outcome) *	
		Concept, stages, measurement (13)	CQ (12) CC (1)	A framework of firm-level intercultural capability (CQ) in the context of offshore outsourcing (Ang and Inkpen, 2008; see org-level outcomes) *
				Conceptualisation of CQ (Ang and Van Dyne, 2008a)
				Conceptualisation on a process model that delineates CQ as a moderator when it comes to translating work experiences to leadership learning outcomes (Ng et al., 2009; see learning) *
				Conceptual foundations of CQ at the organisational level, building on dynamic capabilities (Moon, 2010b)
				Quantitative test of the operationalisation and conceptualisation of the CQ scale (Bücker et al., 2015)
				Introduction of the CQ short-form measure (Thomas, Liao, Aycan, Cerdin, Pekerti, Ravlin et al., 2015)
				Conceptual paper on the extension of situational judgement tests from an intercultural competence perspective (Rockstuhl, Ang, Ng, Lievens, and Van Dyne, 2015)
			<i>See also: Moon, 2010a; Magnusson et al., 2013; Earley and Peterson, 2004; Ang et al., 2006</i>	

Table 5 Overview of clusters (continued)

Clusters	Core research	Core concept	Theme (author) Sequencing from older to newer
The CQ construct and its implementation into the literature (1A: 40)	Antecedent (5)	CQ (5)	<p>Examine the relationship between personality and CQ (Ang et al., 2006; see conceptualisation) *</p> <p>Examine the relationship between cultural exposure and individual CQ (Crowne, 2008)</p> <p>Examine the relationship between EQ and CQ (Moon, 2010a; see conceptualisation) *</p> <p>Examine factors and processes that contribute to CQ development in the context of experiential CQ education (Rosenblatt et al., 2013; see learning) *</p> <p>Examine the relationship between short-term cross-cultural study tours and CQ (Wood and St Peters, 2014)</p>
	Learning (7)	CQ (5) CQ, GM (2)	<p>The CQ concept and its implications for training global managers for global work assignments (Earley and Peterson, 2004; see conceptualisation) *</p> <p>Experiential learning (in developing countries) and CQ/GM (Pless et al., 2011)</p> <p>Experiential learning approach to train CQ (MacNab et al., 2012; see individual-level outcome) *</p> <p>Experiential learning in global virtual teams (GVT) and CQ (Erez et al., 2013)</p> <p>Cross-cultural management courses and CQ (Eisenberg, Lee, Bruck, Brenner, Claes, Mironski et al., 2013).</p> <p>Experiential learning (style) and CQ (Li et al., 2013)</p> <p>Cultural learning in different cultural contexts with a focus on GM and CQ (Mosakowski et al., 2013)</p> <p><i>See also: Rosenblatt et al., 2013; Ng et al., 2009; Mor et al., 2013; Earley and Ang, 2003</i></p>
	Individual-level outcome (7)	CQ (6) CC (1)	<p>Examine the relationship between motivational CQ and cultural adjustment (Templer et al., 2006)</p> <p>Examine the relationship between personality and competencies (such as cultural flexibility, ethnocentrism) on expatriate effectiveness (Shaffer et al., 2006)</p> <p>Examine the relationship between CQ (and expatriate experiences) and cultural adjustment, effectiveness and performance (Lee and Sukoco, 2010)</p> <p>Examine the moderating role of CQ in the relationship between expatriate supporting practices, cultural adjustment and performance (Wu and Ang, 2011)</p>

Table 5 Overview of clusters (continued)

Clusters	Core research	Core concept	Theme (author) Sequencing from older to newer
The CQ construct and its implementation into the literature (1A: 40)			Examine the relationship between motivational CQ and interactions (cultural sales) between people of different origins (Chen et al., 2012; see org-level outcomes) *
			Examine the relationship between CQ and expatriate adjustment (Malek and Budhwar, 2013)
			Examine the relationship between CQ and communication effectiveness and job satisfaction (Bücker et al., 2014)
			<i>See also: Ang et al., 2007; MacNab et al., 2012</i>
			Examine the relationship between CQ and negotiation sequences and outcomes (Imai and Gelfand, 2010)
			Examine the relationship between leader CQ and team performance outcomes (Groves and Feyerherm, 2011)
	Group-level Outcome (4)	CQ (4)	Examine the relationship between cultural metacognition, trust and creative collaboration (Chua et al., 2012)
			Examine the relationship between metacognitive CQ, cultural perspective taking and intercultural collaboration, with a focus on deriving recommendations for training (Mor et al., 2013; see learning) *
			<i>See also: Janssens and Brett, 2006</i>
	Org-level outcome (2)	CQ (2)	Examine the moderating role of CQ in the relationship between leadership and innovation in organisations / units (Elenkov and Manev, 2009)
			Examine the moderating role of export manager's CQ in the relationship between marketing mix adaptation and export performance (Magnusson et al., 2013; see conceptualisation) *
			<i>See also: Ang and Inkpen, 2008; Chen et al., 2012; Earley and Ang, 2003</i>
	Review (2)	CC (1) CQ, GM (1)	A definition and model of CC in IB (that is linked to CQ) (Johnson et al., 2006) A review of theoretical and empirical developments in the inter-cultural competence literature (comprising CC, CQ and GM) (Leung et al., 2014)

Table 5 Overview of clusters (continued)

Clusters	Core research	Core concept	Theme (author) Sequencing from older to newer	
Knowledge management cross-cited over constructs (1B: 10)	Concept, stages, measurement (3)	CQ (1)	A conceptual framework to distinguish between stable and dynamic CC (Leiba-O'Sullivan, 1999)	
		CC,	Conceptualisation on the stages of cultural adaptation (Sanchez et al., 2000)	
		GM (1)	An examination of a four-stage model of developing cultural sensitivity or CQ (Shapiro et al., 2008)	
			CC (1)	<i>See also: Begley and Boyd, 2003; Bückner and Poutsma, 2010a; Lenartowicz et al., 2014</i>
	Learning (2)	CQ, CC (1)	A conceptual learning framework for cross-cultural training programs in MNCs (with a focus on cultural knowledge transfer) (Lenartowicz et al., 2014; see conceptualisation) *	
		CQ (1)	Cross-cultural management education and CQ (and student satisfaction and commitment) (Ramsey and Lorenz, 2016; see individual-level outcome) *	
	Individual-level Outcome		<i>See also: Ramsey and Lorenz, 2016; Taylor et al., 2008</i>	
	Group-level Outcome (1)	CQ (1)	Examine the relationship between CQ and team knowledge sharing (Chen and Lin, 2013) <i>See also: Zander et al., 2012</i>	
	Org-level outcome (2)	GM (2)	Elaborate on the need to embed a corporate GM in company-wide policies (Begley and Boyd, 2003; see conceptualisation) *	
			Examine the relationship between top management orientations and employee commitment in MNC (Taylor et al., 2008; see individual-level outcome) *	
Review (2)	CQ (1)	A review of measurement instruments of global management competencies (CC, GM and CQ) (Bückner and Poutsma, 2010a; see conceptualisation) *		
	CQ, CC, GM (1)	A review of the leadership literature of global teams (involving GM and CQ of leaders) (Zander et al., 2012; see group-level outcome) *		
CQ, leadership and social interaction (1C: 7)	Antecedents (1)	CQ (1)	Relationship between international exposure, languages, orientations, sex, age, and education with BCIQ (Alon, Boulanger, Elston, Galanaki, de Ibarreta, Meyers et al., 2018)	
	Learning (1)	CQ (1)	Experiential cross-cultural training and CQ (Alexandra, 2018) <i>See also: Xu and Chen, 2017</i>	

Table 5 Overview of clusters (continued)

<i>Clusters</i>	<i>Core research</i>	<i>Core concept</i>	<i>Theme (author) Sequencing from older to newer</i>
CQ, leadership and social interaction (1C: 7)	Individual-level outcome (3)	CQ (2)	Examine the mediating role of CC in the relationship between personality and cultural adjustment (Wu and Bodigerel-Koehler, 2013)
		CC (1)	Examine the relationship between CQ and transformational leadership (Ramsey et al., 2017) Examine the relationship between metacognitive and motivational CQ with cultural learning and job creativity of expatriates (Xu and Chen, 2017; see learning) *
CQ and international exposure (2D: 9)	Group-level Outcome (2)	CQ (2)	Examine the moderating role of motivational CQ in the relationship between psychic distance and team performance (Magnusson et al., 2014) Examine the interaction effect between cognitive and metacognitive CQ on an individual's creativity in multicultural teams (Chua and Ng, 2017)
		Concept, stages, measurement (1)	Assessment of the cross-cultural equivalence of the four-dimensional 20-item CQ scale and the two-dimensional 12-item CQ short scale (Bücker et al., 2016) <i>See also: Schreuders-van den Bergh and Du Plessis, 2016; Varela and Gatlin-Watts, 2014</i>
CQ and international exposure (2D: 9)	Antecedents (4)	CQ (4)	Examine the relationship between cultural beliefs and CQ in international sojourns (Chao et al., 2017) Examine the relationship between international sojourns and CQ (Varela and Gatlin-Watts, 2014; see conceptualisation) * Examine the relationship between cross-cultural trigger events and CQ with a discussion of the implications for training (Reichard et al., 2015; see learning) * Examine the relationship between individual motives and CQ in study abroad programs and the mediating role of cultural boundary spanning (Holtbrügge and Engelhard, 2016) <i>See also: Remhof et al., 2013</i>
		<i>Learning</i>	<i>See also: Reichard et al., 2015; Schreuders-van den Bergh and Du Plessis, 2016</i>
CQ and international exposure (2D: 9)	Individual-level outcome (3)	CQ (3)	Examine the relationship between international exposure and CQ, as well as between CQ and the intention to work abroad (Remhof et al., 2013; see antecedents) * Examine the role of motivational CQ in experiential learning and cultural adjustment of expatriates (Schreuders-van den Bergh and Du Plessis, 2016; see learning) * Examine the relationship of CQ and adaptation of expatriates (Presbitero, 2017)
		Review (1)	A review of the research on antecedents, outcomes and moderators of CQ (Ott and Michailova, 2018)

Table 5 Overview of clusters (continued)

Clusters	Core research	Core concept	Theme (author) Sequencing from older to newer
Research involving the GM construct (3E: 11)			A framework for and systematic assessment of measurement instruments of global management competencies (CC, GM and CQ) (Bücker and Poutsma, 2010b)
	Concept, stages, measurement (3)	CQ, CC, GM (1) GM (2)	Examine the relationship between individual and corporate GM and internationalisation (Felicio et al., 2016; see org-level outcome) * Conceptual paper on the need of a manager’s GM to integrate global forces and a global network (Kedia and Mukherji, 1999; see org-level outcome) * <i>See also: Lahiri et al., 2008; Gupta and Govindarajan, 2002</i>
	Antecedents (1)	GM (1)	Examine antecedents of GM (among them education, languages, international experiences) (Story et al., 2014)
	Learning (2)	GM (1) CQ (1)	A framework to reduce the stigmatisation and stereotyping of inpatriates in the home country organisations with a focus on GM (Harvey et al., 2005) Examine the relationship between experiential learning in GVT and different performance outcomes (Taras et al., 2013)
	Org-level outcome (3)	GM (3)	Conceptual framework on GM and its development in a firm context (Gupta and Govindarajan, 2002; see conceptualisation) * Conceptualise on the moderating role of GM in the globalisation and organisational development relationship (Lahiri et al., 2008; see conceptualisation) * Examine the relationship between GM and the performance of offshore service providers (Raman et al., 2013) <i>See also: Felicio et al., 2016; Kedia and Mukherji, 1999</i>
	Review (2)	GM (2)	A review of the literature on GM (Levy et al., 2007) A review of the literature on GM with a focus on its identification and development (Javidan and Bowen, 2013)

Second, the CQ literature has more research on individual-level and group-level outcomes, while the GM literature has more research on organisational-level outcomes. Even if CQ is the dominant construct overall, GM is the preferred construct for organisational-level research. As Andresen and Bergdolt (2017) conclude, there is still uncertainty over the constituents of organisational GM (c.f. Lahiri et al., 2008; Raman et al., 2013; Felicio et al., 2015) and organisational CQ (c.f. Elenkov and Manev, 2009; Magnusson et al., 2013; Moon, 2010b) due to limited research. There is a substantial need for more research on organisational-level CQ and its association with individual-level CQ in the organisation. In this context, GM has consistently been related to managerial cognition (Levy et al., 2007), CQ with individuals, such as employees, expats or managers (c.f. Bücken et al., 2014), and CC has been tested in both the management literature (e.g., Leiba-O'Sullivan, 1999) and international business literature (e.g., Johnson et al., 2006). However, the majority of CQ publications in the sample are published in management journals, while the publications on GM and CC are more often published in both management- and international business-focused journals.

Third, there are sometimes similar publications (from similar teams of co-authors) that loaded under different factors and in different streams (e.g., Bücken and Poutsma, 2010a, Bücken et al., 2015, 2016 loaded under factors 1A, 2D, and 3E). These publications loaded under different factors because they were not co-cited with related publications. Hence, researchers were not aware of their interrelatedness (maybe also triggered by former co-cites remaining in the same stream). As Samiee and Chabowski (2012) notes, this could lead to research streams that remain aware of only a few publications within a certain subfield. Alternatively, some publications showed elevated loadings with several factors, yet remained in the factor with the highest loading (e.g., Taylor et al., 2008 showed a loading with Factor 1 of 0.669, and of 0.571 with Factor 3; full factor loadings are available upon request from the authors). These publications could point to relevant cross-co-cites, as the publications are recognised both in the CQ and GM literature.

We believe that researchers can benefit from the knowledge along the different constructs and from a combination of this knowledge. Figure 4, therefore, sheds light on this existing knowledge and potential areas for knowledge creation across the three concepts. As Shafique (2013) states, science can progress due to the dynamics of convergence among knowledge domains, which results from the fusion and recombination of related knowledge across the boundaries of different knowledge domains. These knowledge spillovers, and the fusion of research streams, may be a dynamic process that continuously feeds the growth of the field.

4.2 *Emerging intellectual streams resulting from the burst analysis*

Table 6 gives an overview of keywords (we took the freedom to complete word stems to full keywords) that emerged from the burst analysis sorted along our coding categories. The weights represent the relevance of a keyword (or burst term) over its active period. Thus, a higher weight may result from a long active period of a keyword, its higher frequency, or both. For instance, the word stem for *language* had the highest weight (3.06), appearing frequently in the titles and original keywords of the publications analysed (from 2015 onwards).

Figure 4 Visual representation of intellectual streams

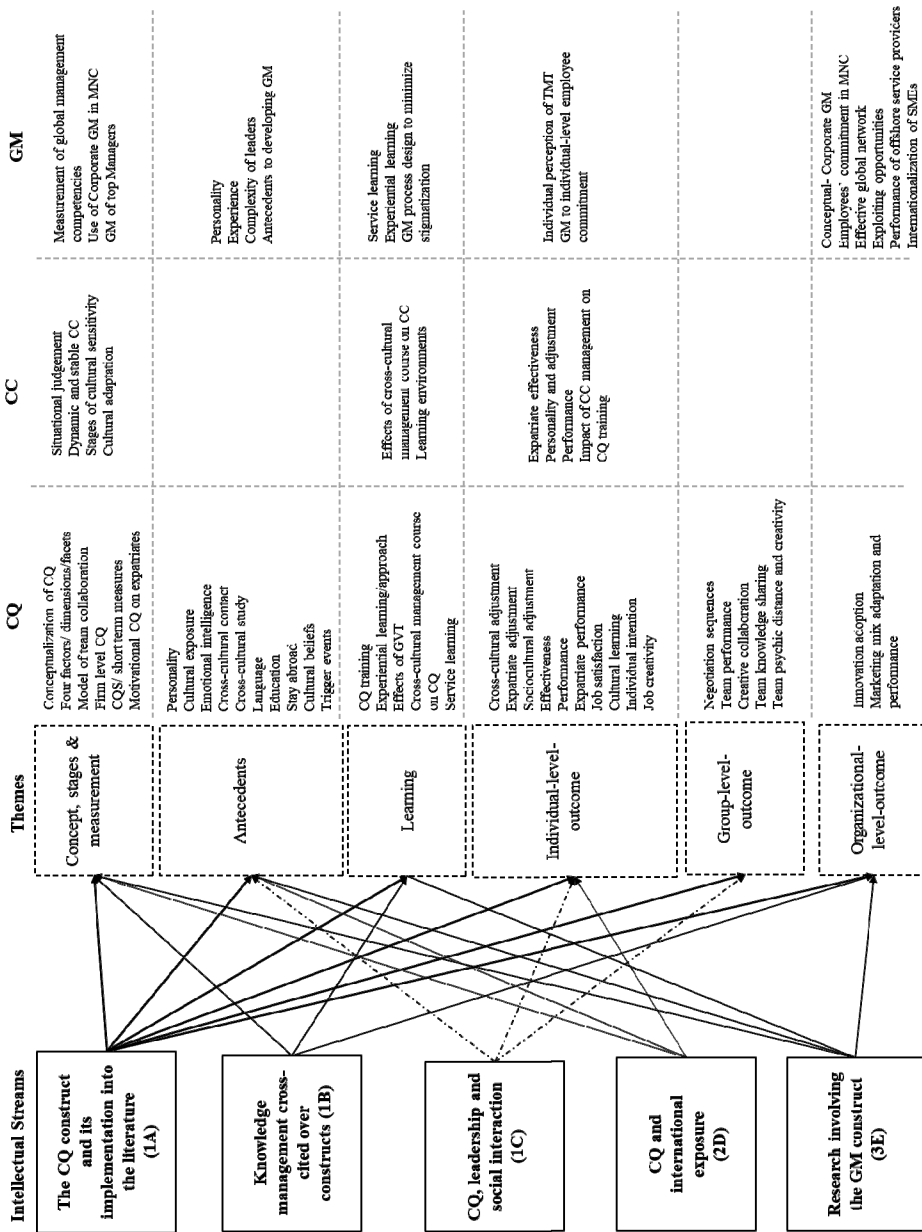


Table 6 Overview of keyword stems from burst analysis

	<i>Weight</i>	<i>Length</i>	<i>Start</i>	<i>End</i>	<i>Context to the keyword</i>
<i>Concept and measurement</i>					
global mindset	1.57	4	1999	2002	developing a mindset for global competitiveness; cultivating a GM
global mindset	2.01	4	2005	2008	leading cultural research in the future - paradigms and tastes; what we talk about when we talk about GM; GM and high-performance work practices
global mindset	1.76	2	2015	2016	individual and corporate GM in internationalisation (2x); effect of GM in client-vendor relationship quality; nurturing GM and leadership
corporate global mindset	1.58	1	2016	2016	GM, cultural context, and the internationalisation of SMEs (2x)
competence	2.48	2	2012	2013	cross-cultural competencies; can business schools make students culturally competent; developing cross-cultural competencies; intercultural competence; an exploratory study of competences required to create customer experience; dynamic cross-cultural competencies (2x); cross-cultural competence of expatriate managers
CQS	1.35	2	2015	2016	measuring CQ; robustness and measurement equivalence of CQS
quotient	1.52	1	2018		business cultural intelligence quotient (BCIQ) (2x)
cultural intelligence	1.91	3	2016		CQ in study abroad programs; impact of cross-cultural management education on CQ; effect of leader CQ on managing national diversity; measuring organisational CQ; CQ and export performance; CQ and trust building among expatriates; CQS; role of CQ in expatriation; role of CQ in turnover intentions; effect of host country language exposure on the development of CQ; CQ and individual and team creativity; CQ and job performance; CQ and leadership; systematic literature review on GM and CQ; CQ and virtual teamwork; CQ and task performance; CQ and consumer ethics; CQ and expatriate adaptation; CQ and transformational leadership; CQ and job creativity; CQ and creativity in teams; enhancing CQ; CQ and benefits from diversity in international alliances; BCIQ (2x); CQ and voice behaviour among migrant workers; global team performance and CQ; a review on CQ; CQ in global project teams; CQ and maladaptation; CQ and conflict management; international experience and CQ development; CQ's role in expatriates' opportunity recognition and innovativeness; CQ meta-analysis; CQ and job satisfaction; CQ and cross-cultural event volunteering

Table 6 Overview of keyword stems from burst analysis (continued)

	<i>Weight</i>	<i>Length</i>	<i>Start</i>	<i>End</i>	<i>Context to the keyword</i>
<i>Antecedents and correlates</i>					
personality	1.59	1	2006	2006	consumer ethnocentrism and personality traits; Big 5 and expatriate effectiveness
capability	2.19	3	2008	2010	intercultural capability, learning capability, dynamic capability
skill	2.11	1	2014	2014	skill cross-cultural competence mechanisms; assessing cross-cultural skills; leadership skills
emotion(al)	1.50	2	2010	2011	emotional intelligence as correlate to the four-factor model of CQ; empathic emotion and leadership performance
psychological capital	1.60	1	2014	2014	psychological capital in international HRM (antecedents of GM); a measure of cross-cultural psychological capital
language	3.06	4	2015		language-based diversity and faultiness in organisations; leading across language barriers; contributing to public goods in native and foreign language settings; language, CQ and turnover intentions; impact of host country language exposure on CQ; language proficiency, adaptability and job performance; it is not all about language ability (CQ's role for task performance)
<i>Learning and training</i>					
develop	1.28	6	1999	2004	developing a mindset for global competitiveness; a developmental expatriate model; expatriate development; development of political skill and capital
learn	1.44	3	2009	2011	from experience to experiential learning in global leader development; cultural learning processes in MNCs; developing global leaders through international service-learning programs
experiential	1.58	2	2012	2013	experiential CQ development; experiential CQ education; develop CQ – moderating role of experiential learning style
student	1.31	1	2013	2013	can business schools make students culturally competent; developing management students' CQ
education	2.10	1	2013	2013	developing cross-cultural competencies in management education; experiential CQ education; effectiveness of Global Virtual Collaboration as a teaching tool in management education
cross-cultural training	1.27	1	2014	2014	application of learning theories to improve cross-cultural training programs in MNCs; short-term cross-cultural study tours

Table 6 Overview of keyword stems from burst analysis (continued)

	<i>Weight</i>	<i>Length</i>	<i>Start</i>	<i>End</i>	<i>Context to the keyword</i>
<i>Individual- and group-level outcomes</i>					
expatriate	2.60	2	1999	2000	a developmental expatriate model; expatriate training and development
expatriate	1.41	3	2006	2008	CQ in IB, a definition and model related to expatriates; management of New Zealand expatriates in China
expatriate	1.38	3	2008	2010	expatriation (what leads to CQ); expatriate stories about cross-cultural encounters
performance	1.65	2	2010	2011	effects of CQ on expat performance; leader CQ; testing moderating effects of CQ on team performance; expatriate performance; leadership performance
leader	1.30	1	2011	2011	leadership performance; developing responsible global leaders; leader CQ and leader and team performance
collaboration	1.39	2	2012	2013	collaborating across cultures (CQ and trust in creative collaboration); global virtual collaboration
work	1.77	2	2013	2014	CQ and intention to work abroad (2x); CQ among host country managers working for foreign multinationals
communication effectiveness	1.37	2	2014	2015	impact of CQ on communication effectiveness; assessing effects of cultural simulation game on communication effectiveness
creativity	1.41	2	2017		CQ and individual and team creativity; unlocking expatriates' job creativity; CQ's effect on creativity in teams
knowledge	2.10	3	2016		effects of knowledge management in client-vendor relationships - mediating role of GM; knowledge hiding in teams; knowledge sharing in teamwork (2x); effect of cultural knowledge on creativity in teams
<i>Organisational-level outcomes and aspects</i>					
firm	1.72	1	2008	2008	role of mindset in a firm's decline in a new competitive landscape; framework of firm-level intercultural capability
organisational	1.93	5	2008	2012	what leads to CQ in multinational organisations (among expatriates); impact of organisational culture on employee commitment; cross-cultural organisational analysis; organisational CQ (a dynamic capability perspective); CQ among expatriates for organisational development; CQ, organisational diversity climate and cultural sales
performance	1.31	1	2013	2013	performance of offshore IT service providers; export performance; expatriate performance
talent management	1.52	1	2018		managing talent in emerging economy MNC; framework for understanding global talent management systems; talent management

Table 6 Overview of keyword stems from burst analysis (continued)

	<i>Weight</i>	<i>Length</i>	<i>Start</i>	<i>End</i>	<i>Context to the keyword</i>
<i>Divers</i>					
socio	1.52	1	2013	2013	effects of CQ on team knowledge sharing from a socio-cognitive perspective; a socio-analytic perspective on CC among expatriate managers
hospitality	1.23	3	2011	2013	hospitality management (2x)
motivation	2.39	3	2016		individual motivations in study abroad programs; exploring the role of motivational CQ in expatriation; motivational CQ and turnover intention; motivational CQ in task performance; intrinsic motivation for successful expatriation; expatriates' job creativity and motivational CQ
review	1.34	2	2017		systematic literature review on the definitions of GM and CQ; CQ review; review on leader individual differences, situational parameters, and leadership outcomes

We find that the concept of GM had several bursts in different periods starting in 1999, the most recent in 2016 with the addition of being related to corporations, i.e., corporate GM. CC had a burst from 2012 to 2013 related to various topics. CQ has a recent and on-going burst. Among the antecedents and correlates of CQ, GM, and CC, language shows an on-going burst from 2015. Publications look at leadership across language barriers (Tenzer and Pudelko, 2015), the role of language proficiency for adaptability and job performance (Jyoti and Kour, 2017), and the relevance of language in comparison to CQ (Presbitero, 2017). Language diversity, barriers, and proficiency are arguably important for predicting cultural-related outcomes because language is embedded across the levels of the individual, the organisation, and the context (country).

Learning, training, and the focus on the development of CQ, GM, and CC peaked between 2009 and 2014. Among the individual-level and group-level outcomes, outcomes show different trends: expatriation had several bursts, starting with a focus on development and training in 1999 to 2000, and performance studies on expatriates had a burst until 2011, a year when leadership research had a peak. More related to group-level outcomes, a burst was identified for group collaboration (2012–2013). Two keywords that also more clearly relate to group-level outcomes are “creativity”, with an on-going burst from 2017, and “knowledge”, with an on-going burst from 2016. Studies refer to CQ and team creativity, knowledge sharing in teams (Bogilovic et al., 2017) or to a combination of the two, namely the effect of cultural knowledge on creativity in teams looking at the role of metacognition (Chua and Ng, 2017). These on-going bursts show the need to organize, conduct or design working teams to address cultural challenges.

Keywords identified in the burst analysis that relate to the organisational level are mainly more generic terms, such as firm or organisational. Here, performance is in focus, especially in 2013. Another keyword with an on-going and recent burst in 2018 is *talent management*. Studies relate to managing talent in emerging economy multinational firms (Tarique and Schuler, 2018) or more generally to talent management (Cerdin et al., 2018). Capturing the best talent can drive organisational performance to impressive heights. Hence, strategies for talent management are desirable.

The burst analysis indicates few areas that entered an on-going burst and qualify as pointing to emerging areas of interest: language, creativity, and knowledge sharing, as well as talent management. For example, future research can compare language-induced emotions and leadership strategies across different contexts (Tenzer and Pudelko, 2015). While metacognition was tested for individual creativity in multicultural teams, the other dimensions of CQ remain to be tested to expand the theoretical depth of cultural knowledge arguments (Chua and Ng, 2017). The underlying creativity processes, together with the dimensions of CQ at the individual level, are worth investigating (Xu and Chen, 2017).

5 Emerging intellectual streams and future research directions

5.1 Trace thought through time and space: use bibliometrics

The dominant academic affiliations of the most prolific authors are scattered geographically: of the 15 prolific authors, five are affiliated with Oceania (33%), four with North America (27%), four with Europe (27%), and two with Asia (13%). To an extent, the findings confirm that becoming a prolific author does not demand affiliation with a specific region – though it is interesting to note that there is a somewhat stronger share of Asia-Pacific-driven publications as compared to other fields. As we also know that researchers are embedded in a certain culture, it could be interesting for future researchers to investigate the potential effects of regional academic affiliations on the research conducted or on an author's output (though we have to note that academic affiliations may change during a research career, which is hard to assess in bibliometrics).

There is a difference when we compare the most prolific authors to the most influential publications (by LCS) in the field: none of the publications by Presbitero, Bückner, Michailova, Ott, Freeman, Lorenz, Ramsey, Felicio, Furrer, and Stahl received enough LCS to be on the list. All of the most influential publications appeared before 2011, with more than half published before 2007, while the majority of the prolific authors who had not received enough LCS had their first publication after 2010. Thus, many of these publications have been around between five to ten years longer than those publications by the most prolific authors, which at least partially explains their LCS. A publication's impact may become more relevant and stronger over time, for instance, leadership became more popular as a research topic and therefore the most cited (Ng et al., 2009). Hence, we recommend that future researchers regularly explore the same field to observe these influences.

Journal influence can be measured via the citations attained for each published article, serving as a benchmark for comparison across journals, their editors, and publishing companies, yet also to track scholarly impact of researchers at universities (Podsakoff et al., 2005). The citation analysis reveals that the most influential journals reside in human resource management, international business, strategy, marketing, psychology, and organisation management. Based on the citation data, the top journals with strong article output have similar impacts in terms of citations per year. There are numerous citations of international business journals which implies that international business-related variables are dominant in the discussion of CQ, GM, and CC. The many citations of journals of marketing, strategy, and organisation management also highlight

the relevance of the concepts to their scholarly debates (e.g., marketing mix adaptations and organisational outcomes). It would be interesting to investigate whether the increase in citations of international business journals for the micro-oriented cultural concepts (e.g., CQ, GM, and CC) affects the citations of those journals for the macro-oriented cultural concepts (e.g., national cultures, cultural distance, values & practices). Future researchers could, therefore, compare the streams of macro-oriented cultural research with micro-oriented cultural research across international business journals.

5.2 You can only manage what you measure: Be mindful on measurement instruments!

Fang et al. (2018) suggested that future researchers should pay attention to CQ measurement reliability and validity, as using the right measurement instrument is key to successful research designs (as in any field, e.g., Richter et al., 2017). More than two dozen instruments have been developed for the quantitative assessment of CQ (Earley and Mosakowski, 2004; Ang et al., 2006; Thomas et al., 2008; Van Dyne et al. 2012; Alon et al., 2016). However, in our view, there is less need for more new instruments, but a greater need for a structured review of instruments to outline the statistical properties and suitability of instruments for different research purposes. In addition, and likewise called for in Matsumoto and Hwang (2013), research is needed that examines the best fit factor structure underlying CQ tests (see Rockstuhl and Van Dyne, 2018), i.e., that further elaborates on how to operationalise the overall CQ construct and individual dimensions. Third, we need further research that demonstrates incremental predictive validity of both the overall construct over other constructs and of sub-dimensions of the construct for different areas (e.g., Richter et al., 2019; see also Matsumoto and Hwang, 2013). Fourth, researchers need to further test the statistical properties, such as measurement equivalence, discriminant validity of sub-dimensions of CQ, and of CQ in contrast to sub-dimensions of GM or CC (e.g., Bückner et al., 2016; Schlägel and Sarstedt, 2016).

5.3 Be like Victor Frankenstein: experiment and scrutinise using solid designs!

A typical limitation outlined in quantitative empirical designs is the dataset's cross-sectional nature. Quantitative researchers often call for longitudinal designs to test causality as we do. Yet another way to improve causality is experiments (e.g., Skelly et al., 2012). Good experiments have high-internal validity and can directly analyse whether the dependent variables are caused by the treatment or antecedents. Replications can then produce cumulative knowledge with high-external validity, i.e., that can be generalized to other populations (Bernard, 2017). An example in the field is an experiment on cultural awareness by Gannon and Poon (1997) that finds that the delivery method of training has no significant difference for the positive effects. Picking up from here, future researchers could, for instance, experiment with interventions during the delivery of training and then observe their effects on CQ, GM, or CC development. This may involve the participants' behaviour (Monkey-see-monkey-do versus material-based training), participant motivation (monetary, personal benefits versus non-monetary, social benefits) or participant cognition (meditation versus reflection, or foreign logical counting versus foreign verbal learning).

We support a stronger use of experimental designs, for instance, in the forms of simulation games (Bücker and Korzilius, 2015), randomly assigned groups, intervention groups or stimuli groups, quasi-experiments (Bogilovic et al., 2017) and field experiments. This can help to simulate effects that aid understanding the underlying processes in the association between antecedents and outcomes of CG, GM, and CC in various themes (e.g., learning, communication, teamwork). Experiments can thereby make a strong contribution to theorising in the field (Weick, 1995). Experimental methods have limitations such as highly controlled (artificial) situations, or a focus on ensuring strong internal validity at the cost of external validity (Punch, 2014; Skelly et al., 2012). Hence, these designs are not the only possible route yet are a promising complement to the research landscape.

5.4 CQ in group processes and outcomes: the roles of knowledge and CQ's moderating impact

We observe a strong and emerging research stream that discusses group-level outcomes of CQ and related team or group processes. This stream's publications discuss the knowledge component, knowledge sharing in collaborations, knowledge generation in groups, and creativity (Bogilovic et al., 2017; Eisenberg and Mattarelli, 2017; Chua and Ng, 2017; Dollwet and Reichard, 2014; Chen and Lin, 2013; Li et al., 2013; Thomas, 2006). With a growing knowledge-based economy where knowledge and information acquisition are increasingly important for performance (Earley and Mosakowski, 2004), this focus seems reasonable from a management perspective.

Hence, we see potential in continuing with this intellectual stream. We call for a deeper look into the processes that lead to knowledge creation and acquisition (including a focus on cognitive CQ) (see also Ott and Michailova, 2018). This may involve a better understanding of the role of 'multicultural' brokers that can recognize the benefits of shared knowledge (Eisenberg and Mattarelli, 2017). This may likewise involve a better understanding of how CQ can foster these knowledge processes and help in moderating unfavourable situations or behaviours, such as knowledge hiding (which may cause great harm in R&D, creative tasks, and security tasks).

We likewise encourage researchers to integrate the research into group-level CQ outcomes, with the broader research field looking at team processes and outcomes. From an international business perspective, this field strongly relies on analysing cultural diversity's impacts on various team outcomes such as creativity, conflicts, communication effectiveness, and social integration. From past studies, we know about cultural diversity's impacts on some of these outcomes, such as a higher creativity, more conflicts and less social integration (e.g., Stahl et al., 2010). Researchers should explore the direct and potential moderating impact of CQ on these group-level outcomes and on the associations between cultural diversity and group-level outcomes. We strongly believe that the field could profit from more integration of the cultural diversity and CQ perspectives in group-related research.

5.5 Collective CQ, GM, or CC: future research from a macro perspective

A key question is how CQ, GM, or CC functions at the macro level. A few authors have already begun to discuss whether these conceptualisations should be context-specific or general, similar to previous debates about universal or specific national cultures

(Fang et al., 2018; Hofstede, 1980). Researchers can analyse the interplays between CQ, GM, and CC scores, traditional approaches to national culture (such as Hofstede and Schwartz), and informal and formal institutional environments.

Researchers should explore whether some countries could improve in the development of CQ, shaping unique culturally intelligent societies. More conceptual work is required to define such societies: Should a high-CQ society be explained by the number of high-CQ individuals in the society? Are there specific CQ dimensions that are more present in one particular society? Are there specific policies or laws that differentiate societies that are more culturally intelligent than others? Future research should address aggregate-level CQ scores on the national level. The within-nation and across-nation distribution of CQ scores also deserves illustration and explanation, as specific subgroups (e.g., genders, occupational groups, cultural archetypes) (see also Javidan et al., 2016; Richter et al., 2016a) may show significant variations that could explain differences. Researchers should explore the underlying processes of how individual CQ, GM, and CC can translate to the national level.

The within-nation distribution also translates into aggregated CQ scores on other levels, such as the organisational or firm and group levels. These scores can then be used to improve empirical studies, which must determine whether it is the individual CQ or an aggregated score for the group or a dyad that explains business outcomes. Researchers can explore whether and how CQ on different levels moderates the relationships between nationality and diversity effects (Rosenauer et al., 2016).

6 Limitations

Before concluding, we briefly outline the limitations of our study: first, it is limited to the use of one database, web of Science. While the use of WoS provides a solid basis for citation analysis, the use of a combination of databases such as Scopus would have provided a more comprehensive set. Additionally, keywords like “cultural intelligence” exist across multiple fields and we limited this study to business and management literature. Owing the emerging nature of the field, our filtration of manuscripts to be included (i.e., journals and book chapters) is also less strictly oriented on journal ranking lists as implemented in other research papers (such as Ott and Michailova, 2018). It involved a partially subjective – though expert-based – selection of outlets. Moreover, we only applied certain types of citation and co-citation analyses and neglected other likewise potentially fruitful options, such as bibliographic coupling. Furthermore, we must acknowledge that based on bibliometric citation analysis, it is impossible to fully understand the reasons why a certain publication was cited. Related to this, the quantitative numbers generated through our factor and cluster analyses were in parts difficult to interpret in terms of underlying content structures. In spite of using automated tools implemented in NVivo, the coding involves some level of subjectivity (e.g., with regard to assignment to a primary coding category). Finally, the conduct of burst analyses depends on specific parameters to be set and results may differ, though not considerably, if the researchers modify these settings.

7 Conclusion

We conducted a systematic review using bibliometric methods of 158 publications on CQ, GM, and CC. We thereby offer an objective approach to assessing the current state of the literature and emerging streams. We list the most influential journals, publications, and specific researchers in the field. We identify five different research streams that show that different researchers tackle the same management and business challenges using different constructs. Hence, we call for a stronger acknowledgement of findings generated separately for the three constructs in the literature. Finally, we outline a potential shared future research agenda on CQ, GM, and CC for advancing the theories in international business and management.

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Appendix 1 Content domains of selected CQ, GM and CC measurement instruments

<i>Measurement instrument</i>	<i>Intercultural traits</i>	<i>Intercultural attitudes and worldviews</i>	<i>Intercultural capabilities</i>
Cultural Intelligence Scale, CQS			x
Global Mindset Inventory, GMI	x	x	x
Global Competencies Inventory, GCI	x	x	x

Source: Adapted from Leung et al., 2014; Cultural Intelligence Scale, CQS: Ang et al., 2007; Global Mindset Inventory, GMI: Javidan et al., 2010; Global Competencies Inventory, GCI: Bird et al., 2010