The cultural dimensions in Supply Chain Management research: A state of the art review and research agenda

Abstract

Purpose –This paper reviews how current SCM research addresses cultural issues, presents a critical assessment of literature, and discusses future research avenues.

Design/methodology/approach – The literature is reviewed using systematic literature review (SLR), bibliometric citation analysis (BCA) and content analysis. 280 relevant papers published between 1995 and 2019 were identified in ISI Web of Science's database.

Findings – Descriptive data is presented on chronological evolution of literature, geographical location, influential papers, and methodology. Four main research areas were categorized, namely: (i) papers on SC integration and performance; (ii) research on continuous improvement and lean initiatives; (iii) studies on the role of culture in sustainability, CSR and green practices; and (iv) studies on emerging topics of research. Most studies focused on organizational culture frameworks, adopted a static approach to culture, and targeted mainly developed countries and Asian emerging countries. A research agenda is suggested based on a multilevel cultural framework including operational and SCM culture.

Implications – Practitioners and researchers will gain a greater understanding of how cultural issues have been addressed in current literature. A multilevel framework is suggested as well as "operational" and "SCM cultures" concepts to address some of the issues identified in current literature.

Originality/value – This study is one of the first literature reviews considering both national and organizational culture dimensions in SCM research.

Keywords – Cultural dimensions, national culture, organizational culture, Supply Chain Management, Systematic literature review, Bibliometric citation analysis.

Paper type – Literature review.

1. Introduction

Culture can be defined as a set of shared values, beliefs, behaviours, and attitudes within a collective (Hofstede *et al.*, 2010; House *et al.*, 2007). Thus, individuals or groups of people in a particular cultural context are inevitably influenced by the cultural atmosphere they live in. Two main cultural dimensions have been highlighted in literature: national culture and organizational culture (Tian *et al.*, 2018; Gupta and Gupta, 2019).

Cultural issues have become relevant in the fields of supply chain management (SCM) and operations management (OM) as most supply chains (SCs) span national borders, meaning that SC members operate in cross-cultural contexts (Murphy *et al.*, 2019). However, a comprehensive literature review assessing the role of cultural dimensions in SCM research is still lacking. Previous reviews have presented a limited perspective of culture in SCM (Gupta and Gupta, 2019; Marshall *et al.*, 2016). There is a need to provide a holistic approach to how cultural dimensions were deployed in current SCM research. This review attempts to present an overview of this growing literature and highlight its gaps, in order to further advance this line of research. In our review, we use the term supply chain management culture (SCMC) to refer to studies investigating cultural dimensions in the context of SCM/OM. The research questions addressed in this review are:

RQ1. How do cultural dimensions feature in current SCMC literature?

RQ2. How did SCMC literature evolve throughout the years?

The literature published on SCMC research is reviewed using systematic literature review (SLR), bibliometric citation analysis (BCA) and content analysis. SLR provides an efficient approach for selecting the most relevant papers in the field (Denyer and Tranfield, 2009), whereas bibliometric analysis is used to present the evolution of the publications and delineate the main research areas, as recommended by several scholars in SCM and operations management (Mishra *et al.*, 2016; Feng *et al.*, 2017). Content analysis of the identified research clusters is deployed to uncover the intellectual structures, i.e. the different research streams in SCMC literature.

The contributions of this review are manifold. First, our review presents a comprehensive assessment of how cultural dimensions were investigated in current SCMC, unlike prior reviews that were either selective or one-dimensional (see for example the review of Gupta and Gupta (2019) on national culture in SCM/OM research and Marshall *et al.*, (2016) on organizational culture). Furthermore, insights regarding the evolution of SCMC research are provided through the identification of four main areas of research and the discussion of

several conflicting issues in current literature. In addition, a multilevel framework is suggested as a future research agenda for both "operational" and "SCM cultures" concepts, to address some of the issues identified in SCMC research.

The article is organized as follows. First, the research methodology is exposed. Next, the results of the review are presented using basic statistics about the articles, countries, authors and methodology. Then, the bibliometric analysis and content analysis findings are discussed before presenting the suggested multilevel framework. Finally, the main conclusions that can be drawn from our research are highlighted.

2. Methodology

There are many definitions of culture and numerous paradigms of cultural theories. The most prevalent paradigm in current organizational research focuses on culture as a set of consensual values (Hofstede *et al.*, 2010; House *et al.*, 2007). Two main cultural dimensions were highlighted: (i) National culture defined as a set of shared beliefs and values that guide human activity (Hofstede, 2001; Hofstede *et al.*, 2010); and (ii) Organizational culture that can be defined as the set of shared assumptions that a group holds and that determines how it perceives, thinks about and reacts to its various environments (Schein, 2010).

Our review adopts a mixed methodology, combining the SLR approach to select the most relevant articles to be included in the review, bibliometric/citation analysis (BCA) and content analysis to assess SCMC literature.

The SLR is an evidence-based approach to identify, select and analyse research papers (Tranfield *et al.*, 2003; De Goey *et al.*, 2019). SLR is based on the principles of transparency, inclusivity and explanatory nature; all of which enhance the objective overview of the search results (Denyer and Tranfield, 2009). BCA is based on the assessment of articles citations and connectivity (Santos and De Domenico, 2015). Using bibliometric measures of citations enable scholars to map a large set of publications, identify the main areas of research and reduce subjectivity and bias, often considered the main pitfalls of traditional literature reviews (Feng *et al.*, 2017). Content analysis is deployed to assess the major research areas in SCMC literature based on the research clusters identified by BCA.

The combination of these methods offers the potential to ensure high-quality results, for objective analysis and repeatable results. Three stages were followed, based on recommendations of several scholars (e.g. Tranfield *et al.*, 2003; Denyer and Tranfield, 2009): (i) planning the review; (ii) conducting the review; and (iii) reporting/disseminating the findings.

2.1. Planning the review

There is a wide divergence of scholarly opinion regarding cultural values and dimensions (Tian *et al.*, 2018; McSweeney, 2015). In the lines with several studies on SCMC (e.g. Gupta and Gupta, 2019; Marshall *et al.*, 2016; Cao *et al.*, 2015), the focus in this review is on cultural dimensions related to national and organizational culture. To avoid bias in data gathering, we used the following criteria in assessing and selecting publications:

1. A search was conducted in the Web of Science (WoS)/Institute for Scientific Information (ISI)'s citation databases that stores publications from various disciplines and fields. WoS databases index more than 8,000 high quality, peer-reviewed journals, providing users with complete bibliographic data, full-length author abstracts, and comprehensive search results (Colicchia and Strozzi, 2012);
2. The review was limited to peer-reviewed publications to guarantee quality (Frandsen, 2017). Articles published in peer-reviewed journals are subject to a rigorous process of evaluation prior to publication (Colicchia and Strozzi, 2012). Consequently, chapters in books, conference proceedings and trade journals were excluded from the search;
3. Conceptual and empirical research on SCMC was considered and no time restriction was applied in order to gather as many publications as possible;
4. Only publications in English were considered, to facilitate data analysis;
5. Subject terms related to cultural dimensions and SCM/OM were used in screening the papers' title, abstract and keywords to assess their relevance. Publications of interest to our review concern business management, economics, SCM and OM.

2.2. Conducting the review

To select keywords that accommodate reliable search terms and capture the topic of the review, an initial search was conducted in WoS directory, using the "title, abstract, keywords" search tools.

The WoS field "topic" was chosen as an inclusion criterion because it evaluates the title, keywords and abstract (Frandsen, 2017). The search terms used in the review include: "supply chain (management)", "national culture", "organizational culture", "culture", "cultural dimensions" and "operations management". These were entered in the fields "title," "abstract," and "keywords". Each search term was entered as a single string joined by the AND operator to maximize the range of targeted papers. The initial search resulted in a total of 583 articles. From this number, several papers were eliminated because they were either

non referenced or published in commercial magazines that were not peer-reviewed and could therefore not be considered as scientific contributions.

For greater accuracy, the authors used search results from the fields "abstract," "author supplied keywords," and the "keyword plus." With the use of "Keyword plus" that indexed papers based on the titles of their cited references, papers that investigated cultural dimensions in SCM without a specific mention in the title, abstract, or keyword can be identified and included.

The authors subsequently read the abstracts in their entirety, to check for their relevance (Derwik and Hellström, 2017; Alkhudary *et al*., 2020). Based on the reading of the abstracts, titles, and keywords of these articles, those that were not relevant and those in which cultural dimensions were treated only peripherally were excluded. The process of refinement resulted in 280 articles from 30 journals published between 1995 and 2019.

2.3. Data analysis

For the bibliometric analysis, BibExcel software provided statistics related to authors' publications. BibExcel is flexible in processing data imported from various databases such as Scopus and WoS, and can generate comprehensive analysis, usable by several network analysis tools such as Gephi, VOSviewer and Pajek (Persson *et al*., 2009).

Network analysis aims to identify established and emerging research topics based on authors' co-citations. Identifying the influential scholars within the clusters reveals the major study fields covered by these researchers. The network analysis uses Gephi to perform citation analysis and identify the main research clusters. Gephi was chosen because it can provide a wide range of visualization and data analysis (Feng *et al*., 2017). Content analysis is based on the approach of Bryman and Bell (2007) to provide classification of SCMC main research areas. In this review, thematic analysis followed the procedure of several scholars (Alkhudary *et al*., 2020; Caputo *et al*., 2016) regarding classification and discussion of qualitative information of the selected papers.

3. Findings

The complete descriptive results of bibliometric and network analysis are not included in the paper due to space constraints, but can be provided by the authors upon request. In the following we present the main findings.

3.1. Bibliometric analysis

The bibliometric analysis is based on the data extracted from the collected articles, namely: title, authors, journal, publication year, keywords, affiliations, citations and references.

3.1.1. Publications' chronological evolution

Based on the year of publications data in Bibexcel, the chronological evolution is presented in figure 1.

Figure 1 Publications number per year of SCMC research

Insert Figure 1 here

Data shows a steady growth in SCMC research since 1995, as well as an exponential surge in publications number from 2013 onwards. Such increase in publications number documents the growing interest in investigating SCM cultural issues.

3.1.2. Research contributions by geographical location

Using the authors' affiliations in the extracted data, we were able to locate their organizations by region and country. Overall, the geographical dispersion of these organizations indicates that SCM culture research has attracted organizations from around the world, but contributing organizations/universities are mainly located in Europe (30.71%), Asia (30.71%) and North America (29.64%). The remaining percentage (8.94%) is the research output of organizations/universities located in other continents (Africa, South America and Oceania).

3.1.3. Analysis of the influential papers/authors

The most common method for measuring the significance of a paper is to count the number of its citations (Ding and Cronin, 2011). Based on the number of citations, the leading papers are shown in Table 1.

Table 1 The leading papers according to citation measure

Insert Table 1 here

The influential articles are papers that have investigated topics related to the role of cultural dimensions in SC integration (Pagell, 2004; Zhao *et al.* 2011), SC performance (Hult *et al.* 2007; Fawcett *et al.* 2007) and implementing strategic initiatives such as risk management (Braunscheidel and Suresh, 2009) and information technologies (Liu *et al.* 2010). However,

the most productive authors in SCMC research include authors like Gunasekaran (9 papers), Childe (4 papers), Kull (4 papers) and Giannakis (4 papers). These scholars are not ranked amongst the most cited in table 1, because their papers were relatively recent and it takes time for a paper to build enough citations.

3.1.4. Methodology of the identified papers

SCMC research was classified according to the methodology deployed by extracting the abstracts of the identified papers (Table 2).

Table 2 Research papers by methodology

Insert Table 2 here

The frequent reliance on empirical research (qualitative, quantitative and mixed methods) indicates the orientation of many papers and the literature's maturity. Along the lines of several scholars assessing the maturity of a research field based on its methods (e.g. Edmondson and McManus, 2007; Cummings, 2007), we suggest that the recurrent use of empirical methods indicates that the field of SCMC has gained legitimacy.

3.2. Network analysis of supply chain management culture literature

Bibliometric measures can help identify the networks of authors and papers, because researchers investigating the same topic tend to cite each other (Feng *et al.*, 2017).

3.2.1. Co-citation analysis and data clustering

Co-citation analysis can be used to explore relationships between authors, topics and journals (Mishra *et al.*, 2016), thus revealing the structure and the evolution of a field over time (Feng *et al.*, 2017). Using the generated ".NET" file in BibExcel, the authors ran the co-citation analysis in Gephi. The co-citation map obtained in Gephi is composed of a set of nodes representing the journal articles and edges that indicate the co-occurrence of nodes/articles in the reference list of the papers (Leydesdorff, 2011). The co-citation map revealed that of a total of 280 articles, 270 have been co-cited in other papers within this sample, generating 10638 links.

The co-citation network can be divided into clusters or modules, based on the density of edges between the nodes which tends to be greater within the same cluster, in comparison with other modules (Leydesdorff, 2011; Feng *et al.*, 2017).

In Gephi, the Louvain algorithm is used to calculate the number of clusters in a co-citation network (Mishra *et al.*, 2016). The Louvain algorithm is based on a mathematical model that calculates the optimal number of partitions (Blondel *et al.*, 2008). Applying this algorithm to the 270-node network yielded six clusters. The number of papers in each cluster varies from 18 in cluster 6 to 68 in cluster 1, the largest cluster. In addition, Gephi computes the modularity index of a partition, measuring the density of links inside communities versus links between communities, with values ranging between -1 and 1 (Feng *et al.*, 2017). Networks with high modularity have dense connections between the nodes and sparse connections with other nodes in different modules (Blondel *et al.*, 2008). In this case, the modularity index is equal to 0.202, indicating a moderate interrelationship between clusters.

3.3. Content analysis and thematic classification of supply chain management culture literature

In line with the approach adopted in several reviews (e.g. Feng *et al.*, 2017; Mishra *et al.*, 2016; Fahimnia *et al.*, 2015) and due to the high number of papers in each cluster, the topic of each cluster is identified based on the thematic analysis of its leading papers. The leading papers were identified based on their PageRank measure. Brin and Page (1998) developed this measure for prestigious papers (Ding and Cronin, 2011; Ding *et al.*, 2009). Prestige is measured by the number of times a paper is cited by highly cited papers (Mishra *et al.*, 2016; Fahimnia *et al.*, 2015).

Each of the leading papers was categorized using the content analysis approach (Bryman and Bell, 2007). The papers were then coded independently based on the abstract and the core content of the articles. A short summary of each paper was also produced to help assess and interpret the data (Alkhudary *et al.*, 2020). Subsequently, samples of the coded papers were swapped and discussed by members of the research team to reach agreement about their categorization (Alkhudary *et al.*, 2020; Caputo *et al.*, 2016). As a result, the authors were able to characterise the focus of SCMC research into four main areas:

(i) Papers investigating the role of cultural dimensions (national and organizational) in *SC integration, success and performance*. Most of the papers focused on the impact and outcomes of cultural dimensions deployment. Studies in that area are represented by the works of scholars such as Cao *et al.*, (2015), Zhao *et al.*, (2011) and Braunscheidel *et al.*, (2010) who examine how culture influences SC collaboration and integration between partners. Other papers highlight the impact of organizational cultural dimensions in SC performance and competitiveness (e.g. Cadden et al. 2010; Cheung

et al., 2010; Manuj *et al.*, 2013; Chang *et al.*, 2016). Such studies, which represent the majority of papers (n=125 papers) often adopted a macro perspective of SCMC. Both quantitative and qualitative methodologies were deployed in this stream of research;

(ii) The second topical area of research relates to the role of organizational culture in risk management, risk mitigation, quality management and lean initiatives (n=76 papers). This line of research is concerned with the role of cultural dimensions in *continuous improvement/lean initiatives*. Fan *et al.*, (2017), Cantor *et al.*, (2014) and Li *et al.*, (2019) are representative studies on culture in risk management. Research on the role of organizational culture's in lean manufacturing, quality management and collaborative initiatives with suppliers is represented by the works of Jia *et al.*, (2016), Subramanian *et al.*, (2015) and Hofer *et al.*, (2011). Most of the studies in this topical area adopted a fragmented approach to SCMC, focusing on upstream processes of the supply chain;

(iii)The third area of research is related to studies on the role of culture in the adoption of sustainability, green environmental practices and CSR initiatives (n=51 papers). These studies were concerned with *cultural dimensions and triple bottom line principles* in SC context. Research has mainly focused on manufacturing, logistics and procurement processes. The works of Yang *et al.*, (2010), Kim and Lee (2012) and Ferri *et al.*, (2016) are representative of studies in this area. Most of the studies in this cluster were based on case studies analysis;

(iv)The fourth area of research is related to new SCMC research avenues or *emerging perspectives of research* (n=18 papers). These studies explore the role of organizational culture in implementing new technologies such as big data (Dubey *et al.*, 2019 a, b), internet systems (Dai *et al.*, 2018) or the influence of knowledge management's culture in SC performance (Tseng, 2010) and of organizational culture deployment in humanitarian logistics (Altay *et al.*, 2018).

4. Discussion

This review highlights how SCMC research has established its legitimacy, as demonstrated by growth in publications, increase in empirical research and diversity of research clusters. Notwithstanding, several conflicting issues in current SCMC research can be identified.

4.1. Conflicting issues in organizational culture studies

The majority of research on organizational culture was conducted in emerging Asian economies such as China and India. This parallels a similar trend in SCM research, due to the growing importance of these countries in the world economy and global supply chains (Liu and McKinnon, 2016). In contrast, there is insufficient investigation in countries and regions such as Africa, Middle East and South America, despite their peculiar cultural aspects (Hofstede *et al.*, 2010).

The results indicate that the majority of papers have focused on organizational culture as an antecedent to SC integration and performance (n=159). In numerous studies, inter-organizational cultural dimensions were assessed or considered "fit" if they contribute to supply chain performance (Cadden *et al.*, 2013, Dubey *et al.*, 2017 a, b). The prevailing perspective in most research is the static role of culture as an explanatory variable, influencing the practices and/or performance of organizations and SC actors (Marshall *et al.*, 2016). The merit of most research on organizational culture in SCM is demonstrating the moderating role of cultural dimensions and/or that they influence companies' practices. Nevertheless, there is a need to shed light on how culture emerges and evolves in operational and SCM settings.

Most of the frameworks adopted in current research on organizational culture were based on competing value framework (CVF) of Cameron and Quinn (2006), cultural intelligence and other operationalized frameworks for SCM research. However, the ontological foundations of such frameworks can be criticized by anthropologists as oversimplification of culture. For anthropologists, culture cannot be divided into several items or different values to be measured and quantified; instead, the emphasis should be placed on the diversity of cultural and sub-cultural structures, through symbols and meanings in an integrated manner (Lévi-Strauss, 1974; 1995; Baskerville, 2003). For anthropologists, such cultural frameworks do not sufficiently delineate the motives, roles and interactions between members of the organization (Marshall *et al.*, 2016).

SCM/OM research can broaden its scope by learning from cultural anthropology. However, despite the call for increasing use of anthropological tools such as ethnography, textual analysis, participant observation and socio-graphic methods (e.g. Singhal and Singhal, 2012; Marshall *et al.*, 2016; Pakdil and Leonard, 2015), few studies were able to adapt these tools in SCMC. This might be attributed to the differences in epistemological approach of SCM and anthropological disciplines that cannot be easily reconcilable (Gupta and Gupta, 2019). While SCM is a reality/applicability geared discipline (Mir *et al.*, 2018), cultural anthropology focuses more on exploration, theorizing and ideology (Lévi-Strauss, 1995; Baskerville, 2003).

4.2. National culture studies: the need for a new paradigm

National culture was investigated in numerous papers (n=56) in which cross-national and comparative studies were prevalent. The aim of these studies was to investigate the role of national culture in strategic initiatives such as SCM integration, sustainability and lean management. Research on national culture has focused mostly on emerging Asian countries such as China, India and South Korea. Since national culture studies in SCM/OM research rely on classical frameworks of Hofstede (2001), House *et al.*, (2007), they are subject to various criticisms. Most cross-cultural studies assume cultural homogeneity and that all people within a nation share the same cultural values (McSweeny, 2015; Kirkman *et al.*, 2006). Thus the main frameworks used in cross-cultural studies reduce human culture to homogenous items. Serious issues were also raised regarding how data is gathered and assessed from various countries and regions (for a detailed criticism of Hofstede's framework and national culture see McSweeny, 2015). Consequently, those aggregate frameworks do not distinguish between cultural differences or subcultures based on ethnicity, language or geographic location, which are important in highlighting cultural values and practices (McSweeny, 2015).

Several suggestions have been made to transcend the conceptual and empirical limitations of cross-cultural SCM/OM research. Some scholars have suggested developing cultural clusters for countries which share similar cultural values. Gupta *et al.*, (2002) proposed ten clusters of South Asia, Anglo, Arab, Germanic Europe, Latin Europe, Eastern Europe, Confucian Asia, Latin America, sub-Saharan Africa, and Nordic Europe. Other scholars call for more qualitative case studies and psychological methodologies that are more sensitive to national cultural values than aggregated research that treats all individuals the same way (Tyler *et al.*, 2000).

4.3. Multi-dimensional studies

Several scholars have called for multi-level cultural dimensions research in OM/SCM (Gupta and Gupta, 2019; Marshall *et al.*, 2016). In general, cross-cultural research has hinted at strong conceptual and empirical relationships between national culture and organizational culture (Hofstede *et al.*, 2010, Kirkman *et al.*, 2006). Nevertheless, research adopting a multi-dimensional approach of culture remains scarce in current SCMC literature. This can be explained by the difficulty in conducting consistent research that simultaneously investigates organizational and national dimensions. There is need for a holistic framework that can underscore the mutual interactions between cultural dimensions. Just as firms learn from

national culture to develop organizational culture, their cultural practices might influence society and affect national culture.

4.4. Developing multilevel cultural research

A dynamic multilevel framework for SCMC research is proposed to address the issues identified in current SCMC literature (Figure 2).

Figure 2 Multilevel cultural dimensions' framework for SCM/OM research

Insert Figure 2 here

Culture is not a static concept that can be quantified easily (Bititci *et al.*, 2006); instead, cultural values evolve and change over time as a result of numerous historical, social and environmental factors. A multilevel framework is suggested consisting of the following levels:

**Individual level:*

From childhood, individuals acquire national cultural values in school, through their families, and their environments (Hofstede, 2001). While national and organizational culture frameworks provide insights, they fail to consider possible differences between individual practices and cultural values and beliefs (König *et al.*, 2006). For instance, managers who are personally low on clan culture may nevertheless encourage clan oriented practices, if they can help them achieve their goals (Schein, 2010). In the multilevel framework, the individual level concerns SC managers and/or executives involved in taking decisions related to operations management processes. The individual level relates to the individual's capability to function efficiently across national, organizational and other cultures through learning, observing and adapting to the culture of other actors and applying this learning to behaviour as stipulated by cultural intelligence theory (Murphy *et al.*, 2019). On a parallel track, the upper echelon theory suggests that strategic choices and decision making of firms is directly linked with cognitive orientations, values and perceptions of managers (Hambrick, 2007). Combining cultural intelligence with upper echelon theory might provide more clarity regarding how managers in SCM/OM deal with cultural differences and interact with other members in the organization.

**Group-Team-organization level:*

Decision makers are often influenced by the cultural interaction between groups-teams inside the organization (Fisher, 2009). Therefore, building on the individual level's assumption, the group-team-organization level corresponds to cultural interactions inside the organization. According to the theory of acculturation, the cultural exchange between team members affects the organizational culture and takes several forms (Berry, 2003). Acculturation is thus an appropriate lens to assess the effects of cultural divergence, convergence and reinforcements (Sam, 2006) resulting from the intra-firm exchange/interaction in OM setting. The group-team level provides a clear perspective of how team members contribute to shape and disseminate a shared set of cultural values in their organization.

**Network-SC level:*

At the network or supply chain level, the interactions between members influence cultural values and dimensions (Marshall *et al.*, 2016). Suppliers and providers of logistics services design their practices according to cultural values of the focal firm. Sometimes focal firms adopt local cultural values if they can enhance performance and efficiency. This process is described in co-evolutionary theory, which emphasizes the interaction between different members of a network (Madhok and Liu, 2006). The co-evolutionary theory underlines the evolutionary change resulting from managerial adaptation and environmental evolution, occurring at the macroevolution level (the coevolution between the firm and its environment), and micro-coevolution (related to intra-firm co-evolution) (Cantwell *et al.*, 2010).

The aim of the multilevel framework is to highlight the interactions occurring between the three levels - individual-organizational-SC/network, thus transcending the discrepancies between national and organizational dimensions. To transcend some of the discordances between SCM/OM and cultural anthropology, efforts to conceptualize "operational culture" as a distinct construct can be suggested to highlight cultural orientations and values adopted by workers, management and other stakeholders.

**OM/SCM culture*

Operational culture can be defined as a set of beliefs and values pertaining to firms' operations management (procurement, inventory, transportation, warehousing, reverse logistics). Along the lines of the attempts in previous studies to highlight "lean culture", "eco culture" and "risk culture", operational culture puts forward a dynamic perspective based on practices and behaviour (Marshall *et al.*, 2016). Thus, operational culture should be viewed as a dynamic construct that shapes the cultural orientations of firms, which can be acquired and altered.

By enlarging the boundaries of operational culture to integrate multi-firm or network cultural values, "supply chain culture" concept might be proposed to specifically refer to shared cultural values of SC members regarding collaboration, integration, exchange of information and management of SC processes. Several methodologies (quantitative, qualitative, mixed or anthropological/ethnographic approaches) can be suggested to investigate those operational cultural values/orientations in intra-organizational and inter-firm settings. In the final analysis, conceptualization of operational and supply chain cultures might provide the dynamic and evolving features of "culture" that have been seldom investigated in current SCMC literature.

5. Conclusion

This literature review has several implications for the SCMC research community.

5.1. Theoretical contributions

The review provides clear understanding of cultural dimensions research in OM/SCM studies and sheds light on how such issues were investigated in extant literature. Specifically, several issues were identified in prior research, namely the reliance on popular organizational and national cultures frameworks that have been frequently criticized from conceptual and empirical standpoints, the static approach to culture that underscores its dynamism and evolutionary nature, the scarcity of multilevel/multidimensional research and the lack of a specific SCM/OM cultural lens.

A multi-level framework is proposed to advance SCMC research and address some of the limitations of prior studies. The aim of the framework is to contribute to current research, by highlighting the interaction between the individual, organizational and SC levels that several scholars call for (Gupta and Gupta, 2019; Marshall *et al.*, 2016) and which can ultimately enhance the validity of SCMC research. In addition, the multilevel framework seeks to put cultural dimensions upfront, instead of merely investigating culture as a moderating or mediating variable. Finally, the proposed multilevel framework emphasizes operationalization and measurement of OM/SCM culture, which extends the scope of current SCMC research beyond descriptive and fragmented approaches. In doing so, the multilevel framework provides a research agenda for operational and SCM cultures.

Future research might draw inspiration from the multilevel framework by investigating how national and subnational cultures interact and evolve at the country level, whilst operational and SCM cultures develop at the organizational and SC level. Based on frequently used cultural models such as Schwartz (1994), Trompenaars (1994) and Lewis (1991) or by testing

new ones in OM/SCM such as Juri Lotman's semiotic approach (2013), scholars might try to conceptualize items related to OM/SCM cooperation, integration and efficiency.

5.2. Managerial contributions

Despite the fact that literature reviews do not yield practical recommendations for companies, this research might be of interest to firms because it demonstrates the growing interest of OM/SCM scholars and practitioners in cultural dimensions. Cultural values and practices matter because they help companies become more flexible, by responding to the business environment (Fusch *et al.*, 2016).

Furthermore, the multilevel framework might give firms a clear perspective of how such issues relate to their context, and translate such theoretical concepts into practices that can be assessed in future. Thus, the suggested framework allows companies to address issues at the intra-organizational level, through interactions between national and organizational dimensions. For instance, OM/SCM workforce/team is not immune to issues related to gender, race, age, sexual orientation and diversity. These can be efficiently addressed when the influences of national and sub-national cultures are delineated. Likewise, at the SC level, the multilevel framework helps articulate how cultural dimensions might influence initiatives that companies and their SC partners adopt, such as sustainable supply chain management, lean management and risk management. Finally, the research agenda proposed focuses on operational and SCM cultures that primarily emphasize practices, perspectives and values of companies rather than adopting the assumptions of some theoretical frameworks that executives and managers might not always relate to.

5.3. Research limits

The limitations of this review are mainly related to the database and sources of the research. Most literature reviews carry a risk of either excluding important papers or including irrelevant articles. The articles included in our sample were extracted from the Web of Science database. Despite its capacity, it is possible that some papers may still be missing. Some of the terms used in the search might also generate items that are not relevant to our topic. For instance, the broad terms "culture" and "dimensions" have resulted in some irrelevant papers. However, the authors were able to widen the search without increasing the number of irrelevant papers by following the criteria specified in our SLR. Hence, the sample of articles investigated represents an accurate perspective of SCMC research during the period covered by the review.

In the final analysis, this literature review is an endeavour to provide a holistic view of the research structure and its main topical areas. SCMC research is expected to evolve rapidly and significantly in the future. This research provides suggestions for further research avenues to deepen the understanding of how cultural dimensions pertain to SCM practices.

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Table 1 The leading papers according to citation measure

Authors (year)	Citations	Cites per year
Braunscheidel and Suresh (2009)	391	35.55
Pagell (2004)	369	23.06
Zhao et al. (2011)	271	30.11
Hult et al. (2007)	264	20.31
Fawcett et al. (2007)	181	13.92
Liu et al. (2010)	167	16.70
Yang et al. (2010)	164	16.40
Chan et al. (2012)	140	17.50
Cheung et al. (2008)	129	12.90
Cannon et al. (2010)	127	12.70

Table 2 Research papers by methodology

Methodology	Number of papers	Percentage
Empirical	242	86.42%
Quantitative survey	172	
Case Study and qualitative study	59	
Mixed and multi-methods	11	
Conceptual	38	13.57%
Reviews, meta-analysis	23	
Modelling mathematics (Hybrid, AHP, fuzzy)	5	
Conceptual frameworks	10	
Sum	280	

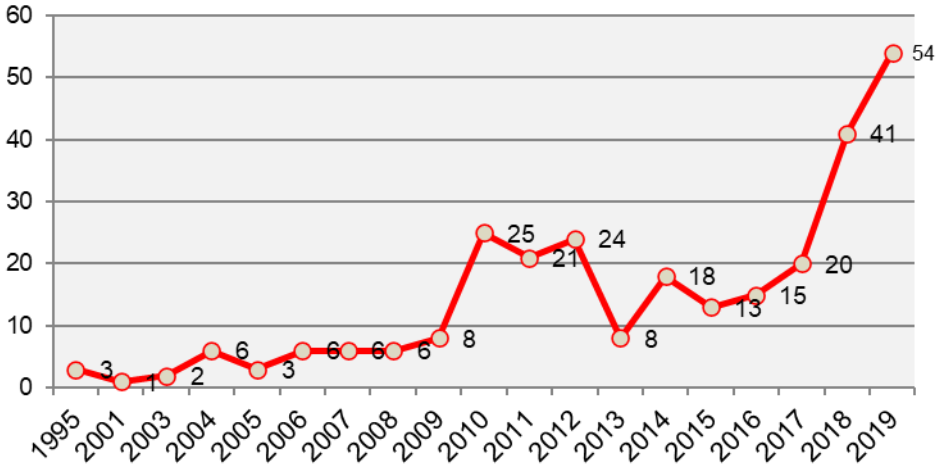

Figure 2 Multilevel cultural dimensions' framework for SCM/OM research