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A Review of the Existing and Emerging Topics in the Supply Chain Risk Management Literature

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ABSTRACT

This review examines supply chain risk publications across nine prestigious management, operations, and supply chain journals with respect to exploring trends and emerging topics. Using a refined set of keywords, we extract and filter the most relevant supply chain risk management (SCRM) articles from Scopus between 2001 and 2019. Unlike previous reviews of the SCRM literature, our methodology utilizes both bibliometric and cocitation analyses of publications in selective management and operations and supply chain management journals. In addition to analyzing the current state of the SCRM literature via bibliometric analysis, we delve deeply into the clusters of literature informing SCRM studies through a cocitation analysis. By conducting a text analysis on these clusters, we identify the main themes and provide insights regarding article relevance, theoretical frameworks, and methodologies for each cluster. In addition, we categorize the themes within each cluster into three main groups of matured, developing, and emerging. Based on the identified categories, we provide detailed discussions on the promising avenues for research and practice in three main areas of sustainable SCRM, behavioral SCRM, and nascent methodologies and theories in SCRM studies. Finally, we dedicate a section in our review to discussing the direction of SCRM research during and after the coronavirus disease 2019 era. [Submitted: May 13, 2020. Revised: May 18, 2020. Accepted: May 18, 2020.]

Subject Areas: Cocitation Analysis, Supply Chain Resilience, Supply Chain Risk, and Systematic Review.

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INTRODUCTION

The global risk climate is changing rapidly (WEF, 2020). Considering the escalating intensity of extreme weather (e.g., Australian bushfires in 2019–2020, global loss of biodiversity), powerful economic forces changing global trade landscapes (e.g., U.S.–China trade war, Brexit), and the increasing frequency of a variety of other types of *black swan* (e.g., Global Financial Crisis) (Taleb, 2007) and *grey rhino* (e.g., cyber security and data integrity) (Wucker, 2016) risks, supply chains are experiencing an unsettling global trade context with prospective and significant adverse consequences for their businesses. For example, the recent outbreak of the coronavirus disease 2019 (COVID-19) has had such a devastating impact on the global economy (Smialek & Tankersley, 2020) that there have been speculations about this pandemic causing another financial recession (Casselman, 2020), with severe disruptions expected to hit supply chains hard in the upcoming months (Haren & Simchi-Levi, 2020). Amid this global calamity, *supply chain risk* and/or *supply chain disruption* are keywords that media and practitioners are constantly enumerating in their assessment of the harms done to businesses, implying the significant yet challenging task of managing risk in supply chains within similar situations.

The supply chain risk literature has matured substantially over the past two decades. A simple keyword search of *supply chain risk* on Scopus reveals more than 900 journal papers. The scholarly review literature on this topic can be categorized into two main areas: either (i) focusing on providing holistic reviews and frameworks for identifying, categorizing, assessing, and/or managing supply chain risk (see Table 1 for a summary of the most influential supply chain risk management [SCRM] review papers), or (ii) providing a narrower focus on a certain type of risk, such as climate change (Ghadge, Wurtmann, & Seuring, 2020), sustainability-related supplier risk (da Silva, Ramos, Alexander, & Jabbour, 2020), or information sharing risk (Colicchia, 2019), to name a few. In a recent study by Manhart, Summers, and Blackhurst (In press), they specifically focus on a meta-analytic review to test how buffering and bridging strategies affect SCRM, investigating whether cultural differences play a role in this relationship. What differentiates our review from prior work on SCRM is the utilization of an exploratory cocitation analysis that examines article frequency pairs to identify prominent types of supply chain risks, risk management frameworks, and topics that have been introduced and studied in the literature. Thus, in this regard, our article positions itself at the intersection of the two aforementioned types of review papers on the SCRM topic. Furthermore, we narrow down our search of papers to the top operations and supply chain management (OSCM) journals included in internationally recognized journal ranking lists (e.g., *Financial Times Top 50 Journals [FT 50] and the UTD Top 100 Business School Research Rankings*), as well as professional OSCM bodies such as the *Council for Supply Chain Management Professionals (CSCMP)*, *Decision Sciences Institute (DSI)*, and *Institute for Supply Management (ISM)*. In summary, the advantages of our approach lie in adopting a holistic method (i.e., a systematic review and a combination of bibliometric and cocitation analyses) for developing in-depth discussions of the emerging SCRM topics in the leading OSCM journals through (i) a bibliometric analysis of the pool of articles we obtain from Scopus

Table 1: Review of the most influential SCRM review articles.

Author(s) (Year)	Review Method	Selective Set of Reviewed Journals (Yes/No)	SCRM Areas Covered / SCR Classifications	No. of Articles Covered	Publication Dates Covered	Main Identified Research Directions	Citation Count (as of March 2020)
Tang (2006)	Conceptual	No	• Supply management • Demand management • Product management • Information management	200+	1964–2005	• Incorporating nonstationary supply and demand processes • Considering alternative objective rather than cost/profit for disruption risks • Including dynamic supply configurations of suppliers in supply management strategies • Including dynamic pricing/revenue management in demand management strategies • Including dynamic assortment planning in product management strategies • Including Collaborative Planning, Forecasting, and Replenishment systems in information management strategies	1,119

Continued

Table 1: Continued.

Author(s) (Year)	Review Method	Selective Set of Reviewed Journals (Yes/No)	SCRM Areas Covered / SCR Classifications	No. of Articles Covered	Publication Dates Covered	Main Identified Research Directions	Citation Count (as of March 2020)
Rao and Goldsby (2009)	Conceptual	No	• Environmental risks • Industrial risks • Organizational risks • Problem-specific risks • Decision-maker risks	55	1998–2008	Using their proposed typology of risk to: • investigate the impact of risks on supply chains • investigate supply chain partner engagement • assess the benefits of visibility on reducing supply chain risk	281
Tang and Musa (2011)	Citation/ Cocitation analysis	No	• Material flow risk • Financial flow risk • Information flow risk	138	1995–2009	• Developing quantitative models • Paying more attention to information flow risk	418
Colicchia and Strozzi (2012)	Systematic literature network analysis (citation analysis)	No	• Complexity and uncertainty • Practices and tools for SCRM • Organization of SCRM process • Increased supply chain resilience and robustness	55	1994–2010	• Incorporating supply chain complexity • Incorporating resilience and robustness in supply chain modeling • Managing disruption risks • Considering supply chains as interactive open systems • Assessing the value of supply chain resilience and robustness	233

Continued

Table 1: Continued.

Author(s) (Year)	Review Method	Selective Set of Reviewed Journals (Yes/No)	SCRM Areas Covered / SCR Classifications	No. of Articles Covered	Publication Dates Covered	Main Identified Research Directions	Citation Count (as of March 2020)
Sodhi et al. (2012a)	Participant observation, informant interviewing, and enumeration (survey)	No	• SCRM definition gap • SCRM process gap • SCRM methodology gap	31	1998–2010	• Developing a clear definition of SCRM • Conducting research on the response to supply chain risks • Conducting more empirically oriented research on SCRM	1,035
Ho et al. (2015)	Systematic literature review	No	• New SCRM definition • Supply chain risk categorization (macro risk, demand risk, manufacturing risk, supply risk, and infrastructural risk) • Factors affecting supply chain risks • Classification of quantitative and qualitative SCRM methods	224	2003–2013	• Conducting research on infrastructural, manufacturing, or process risks • Exploring interrelations among various risk groups • Assessing the correlations between risk factors or probability of occurrence of each risk factor • Using empirical research to test existing SCRM models • Focusing on underrepresented sectors (e.g., public sector, renewable energy sector) • Paying more attention to service supply chains and the risk monitoring process • Benchmarking risk mitigation strategies • Adding "risk recovery" to SCRM approaches • Quantifying costs and benefits of SCRM	276

Continued

Table 1: Continued.

Author(s) (Year)	Review Method	Selective Set of Reviewed Journals (Yes/No)	SCRM Areas Covered / SCR Classifications	No. of Articles Covered	Publication Dates Covered	Main Identified Research Directions	Citation Count (as of March 2020)
Heckmann et al. (2015)	Conceptual	No	• Providing a clear definition of risk within SCRM • Reviewing quantitative approaches to SCRM based on the definition of supply chain risk and risk measures	162	N/A	• SCRM approaches should address both efficiency- and effectiveness-driven objectives • SCRM approaches should comprise factors such as a decision-maker's risk attitudes and/or environmental factors • Integrating time-based characteristics into risk assessments	288

published in 2001–2019, (ii) cocitation and cluster analyses of the collected articles, identifying 10 major SCRM-oriented focal clusters spanning multiple fields of study, and (iii) building on our findings in the bibliometric and cocitation analyses to develop emerging discussions and topical areas in the SCRM literature. Our review highlights areas of research in SCRM and in leading supply chain and operations management outlets that are either *matured*, *developing*, or *emerging;* thus, it provides suggestions for future research primarily based on the emerging clusters.

In what follows, we first explain our methodology with respect to how we extracted relevant SCRM papers from selective OSCM journals, conducting bibliometric, as well as cocitation analyses. Next, we further explore the clusters appearing from the cocitation analysis and identify the overarching OSCM-related, methodological, and theoretical papers in each cluster. Built on the bibliometric and cocitation analyses, we discuss the emerging debates in the SCRM literature by simultaneously addressing the rapidly changing risk climate globally. Due to the unravelling situation with respect to the COVID-19 pandemic and the relevance of this topic to our review, we dedicate a separate section to discuss possible future directions in supply chain resilience and crisis management. Finally, we conclude by enumerating a summary of our findings, as well as limitations and implications of our study for future research in SCRM.

METHOD

Extracting and Analyzing SCRM Literature

Our search scope for SCRM articles is limited to eight major journals in OSCM (recommended by www.scmlist.com), as well as the *Academy of Management Journal* (AMJ). These eight major journals collectively represent the list of publications in the *Financial Times Top 50 Journals (FT 50)* and *the UTD Top 100 Business School Research Rankings* ^{TM} journal rankings, along with professional bodies, namely the CSCMP, DSI, and ISM. Therefore, the final list of journals selected for this review includes *Management Science* (MS), *Journal of Operations Management* (JOM), *Manufacturing & Service Operations Management* (MSOM), *Production and Operations Management* (POM), *Operations Research* (OR), *Journal of Supply Chain Management* (JSCM), *Decision Sciences Journal* (DSJ), and *Journal of Business Logistics* (JBL). The OSCM community does not represent a high quantity of scholarly articles among the AMJs. Nevertheless, the relevant publications in AMJ are significantly impactful on SCRM and are therefore included and discussed in our review.

There are a number of search engines available for finding scholarly articles across various publishers and journals. Among others, the main search engines include Scopus (www.scopus.com) and Web of Science (www.webofknowledge.com). To conduct our search of the literature, we opted for the Scopus search engine, which is widely accepted and used for literature mapping and cocitation analysis purposes (e.g., Fahimnia, Pournader, Siemsen, Bendoly, & Wang, 2019; Pournader, Shi, Seuring, & Koh, 2019). In general, Scopus provides a more extensive coverage of articles in *Business, Economics, Management*, and *Social Sciences* (Mongeon & Paul-Hus, 2016; Martín-Martín,

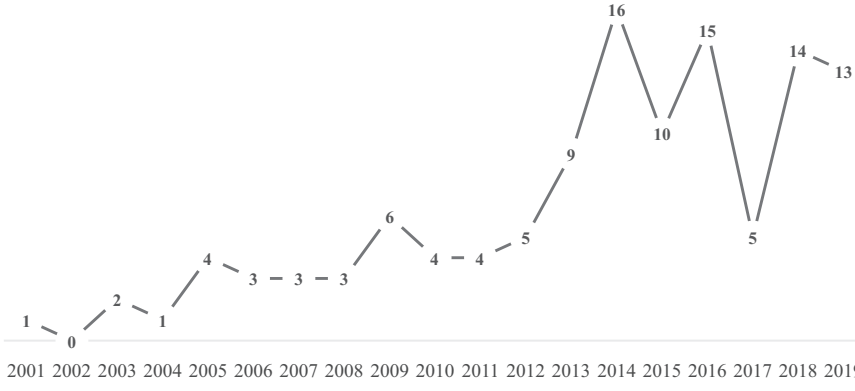
Orduna-Malea, Thelwall, & Delgado López-Cózar, 2018). Furthermore, based on our personal experience, Scopus provides a pool of articles that are most relevant to the topic of study, compared to Web of Science. Aside from these differences, the output of both search engines (i.e., Scopus and Web of Science) can be exported for use in cocitation and social network analysis software packages.

To conduct a search for the SCRM literature across the nominated journals, we needed to devise and test a set of keywords that would provide the maximum coverage of relevant papers in the Scopus database. We used a set of proposed keywords (i.e., *supply chain risk, supply chain vulnerability, operations risks, supply chain resilience, and sustainability risk*), which we double-checked against the initial results from Scopus with the five most recent (i.e., Heckmann, Comes, & Nickel, 2015; Ho, Zheng, Yildiz, & Talluri, 2015; Tukamuhabwa, Stevenson, Busby, & Zorzini, 2015; Giannakis & Papadopoulos, 2016; Macdonald, Zobel, Melnyk, & Griffis, 2018) and the five most cited (i.e., Tang, 2006; Tang & Tomlin, 2008; Manuj & Mentzer, 2008b; Ponomarov & Holcomb, 2009; Tang & Musa, 2011) SCRM reviews from Scopus. We found a number of papers missing, for which we added and tested an additional number of keywords. Each keyword was added individually first, controlling for the number of papers it would add to the original database. If this keyword yielded an extensive number of papers (e.g., 15–20) that were mostly irrelevant, we replaced the keyword and tested it again. Our search was limited to the eight top OSCM journals and the AMJ with a timeline bound to the end of 2019, controlling for the new decade (i.e., 2020s). The search algorithm we used in Scopus, which resulted in finding 119 articles, is included in the Appendix.

Bibliometric Analysis of the Results

To determine viability, we screened the resulting 119 articles using at least two coauthors for the paper across multiple dimensions. First, we checked to make certain that the aforementioned algorithm provided results that would match the search criteria (e.g., search words, journal specifications, etc.). All 119 articles passed this initial litmus test. Next, we evaluated each article individually to check for consistency and alignment regarding the topic under consideration. Risk was allotted a fairly broad definition to contain "a chance of danger, damage, loss, injury, or any other undesired consequences" (Harland, Brenchley, & Walker, 2003). In terms of supply chain risk, this encapsulates the uncertainty and impact of disruptions on future supply chain-related decision-making processes (Manuj & Mentzer, 2008a). This secondary coding process resulted in 108 articles that fit the criteria exactly, with another six containing enough of an emphasis or focus on supply chain risk to warrant inclusion. That said, five articles were flagged as not pertaining directly or related to supply chain risk factors. These articles, for example, dealt with risks or uncertainty that were focused primarily on internal firm operating systems. Therefore, these five articles were removed from the analysis, rendering the algorithm 95.8% effective, given the selected articles under consideration. It should be noted that the five papers that did not fit the criteria did indeed contain the text "supply chain risk" in their keywords. It is perhaps somewhat disconcerting that these aforementioned articles (four out of five were

Figure 1: Frequency of publications for the selective 118 SCRM articles per year.



published after 2012) had little or nothing to do with supply chain risk, and yet were identifying themselves as such.

For the resulting 114 articles in our database (see online Appendix A1), a manual journal screening from 2000 to 2019 revealed four articles that were not included in the initial search due to title-related content and keywords that did not contain the search parameters under consideration, thus resulting in a total of 118 articles. The top authors with respect to publication frequency are Craighead, C.W. (8 articles), Babich, V. (6 articles), Blackhurst, J. (5 articles), Bode, C. (5 articles), Talluri, S. (5 articles), and Wagner, S.M. (5 articles). The frequency of publications per the selected journals includes POM (23 articles), DSJ (18 articles), JBL (16 articles), JSCM (15 articles), MSOM (15 articles), JOM (14 articles), MS (8 articles), OR (7 articles), and AMJ (2 articles), respectively. The frequency of publications per year is shown in Figure 1.

Our initial bibliometric analysis revealed that 61 articles, approximately 52% of the sample, did not mention or leverage existing theory, leaving 57 articles for which the most prominent theories leveraged were game theory (9), contract theory (6), information processing theory (5), agency theory (5), inventory theory (5), systems theory (5), resource-dependence theory (4), the resource-based view (4), and real options theory (3). Other notable theories that surfaced less frequently were attribution theory, contingency theory, justice theory, portfolio theory, resource orchestration theory, signaling theory, and transaction cost economics. It should be mentioned that five articles utilized grounded theory systematic methodology, using inductive approaches to construct or build upon existing theory. Some of the theories elaborated upon were information processing theory, resource orchestration theory, and systems theory.

In terms of the methodologies employed, the most frequently observed were analytical modeling (57), empirical quantitative (32), qualitative (19), experimental design (7), and literature reviews (5). We found that the data sources most commonly utilized were archival (30), survey (24), and interview (21). Mixed

Table 2: Extant methodological landscape.

Academy of Management Journal	2
Empirical quantitative analysis	2
Decision Sciences	18
Analytical modeling	4
Empirical quantitative analysis	4
Experimental design	3
Literature review	1
Mixed method (Analytical modeling—Quantitative)	4
Mixed method (Qualitative—Quantitative)	1
Qualitative	1
Journal of Business Logistics	14
Analytical modeling	3
Conceptual	3
Empirical quantitative analysis	1
Literature review	1
Mixed method (Qualitative—Quantitative)	1
Qualitative	7
Journal of Operations Management	14
Analytical modeling	1
Conceptual	2
Empirical quantitative analysis	7
Experimental design	2
Mixed method (Qualitative—Quantitative)	1
Qualitative	1
Journal of Supply Chain Management	15
Conceptual	3
Empirical quantitative analysis	4
Experimental design	1
Mixed method (Qualitative—Quantitative)	2
Qualitative	5
Management Science	8
Analytical modeling	8
Manufacturing and Service Operations Management	15
Analytical modeling	13
Literature review	1
Mixed method (Analytical modeling—Quantitative)	1
Operations Research	7
Analytical modeling	7
Production and Operations Management	23
Analytical modeling	16
Conceptual	1
Empirical quantitative analysis	4
Literature review	2

method approaches were used 10 times, most commonly combining analytical modeling techniques with empirical quantitative methods (five observations) or quantitative and qualitative methods (five observations). It should be noted that nine articles were conceptual in nature (see Table 2). We discovered that, overall,

DSJ contained the most breadth and diversity in terms of the methodologies employed, with the JBL, JSCM, and JOM similarly aligned.

Cocitation Analysis and Forming Clusters

Citation analysis, cocitation analysis, and bibliographic coupling are among some of the most popular science mapping approaches. Citation analysis is subject to a number of limitations that make it a less preferred approach for literature mapping (see Pilkington & Meredith, 2009). Among these approaches, cocitation analysis has widely been adopted in the OSCM literature due to its coverage and cluster analysis capabilities (e.g., Fahimnia, Sarkis, & Davarzani, 2015; Khorram Niaki & Nonino, 2017; Xu et al., 2018; Ben-Daya, Hassini, & Bahroun, 2019; Fahimnia et al., 2019; Pournader et al., 2019). In addition to a satisfactory level of coverage by cocitation analysis, the accuracy of the outcomes for cocitation analysis is analogous to bibliographic coupling (Boyack & Klavans, 2010; Yan & Ding, 2012).

While citation analysis considers the global citation of articles and ranks their importance based on the frequency of citations (Garfield, 1979), cocitation analysis investigates the frequency of pairs of articles that are cocited in a given pool of articles (Small, 1973). Thus, the more an article is cocited with others, the more influential it becomes. Moreover, cocitation analysis helps with respect to forming clusters of cited articles by conducting network analyses (i.e., the more a pair of articles are cocited, the higher the chance they will be categorized in a similar cluster [Clauset, Newman, & Moore, 2004; Leydesdorff, 2011]). Extracting clusters helps unravel and identify subject areas that inform a field of study. We will examine the emergent cocitation clusters from the pool of SCRM articles identified in this article.

There are two major steps in conducting the cocitation analysis. The first step is to conduct a network and graph analysis of the cocitation network, for which we used the Sci2 Tool (Sci2, 2009) open-source software package. To do this, we loaded the CSV data file of the articles from Scopus to Sci2 and conducted the cocitation analysis using Sci2 features. The main categories of information in this CSV file included data on the authors, year of publication, title, journal, keywords, global citation, and references. Sci2 offers other features, including coauthor network analysis and co-occurrence network analysis. For the purpose of our study, we primarily focused on cocitation analysis. The cocitation output from Sci2 can be directly visualized on Gephi[1] network visualization software. Gephi 0.9.2 was used to conduct cluster and page rank analyses, as well as visualize the SCRM cocitation network. Overall, the cocitation network was strongly connected and had 7,031 nodes (i.e., the total number of references cited by the SCRM articles) and 322,519 edges (i.e., the total number of cocited references).

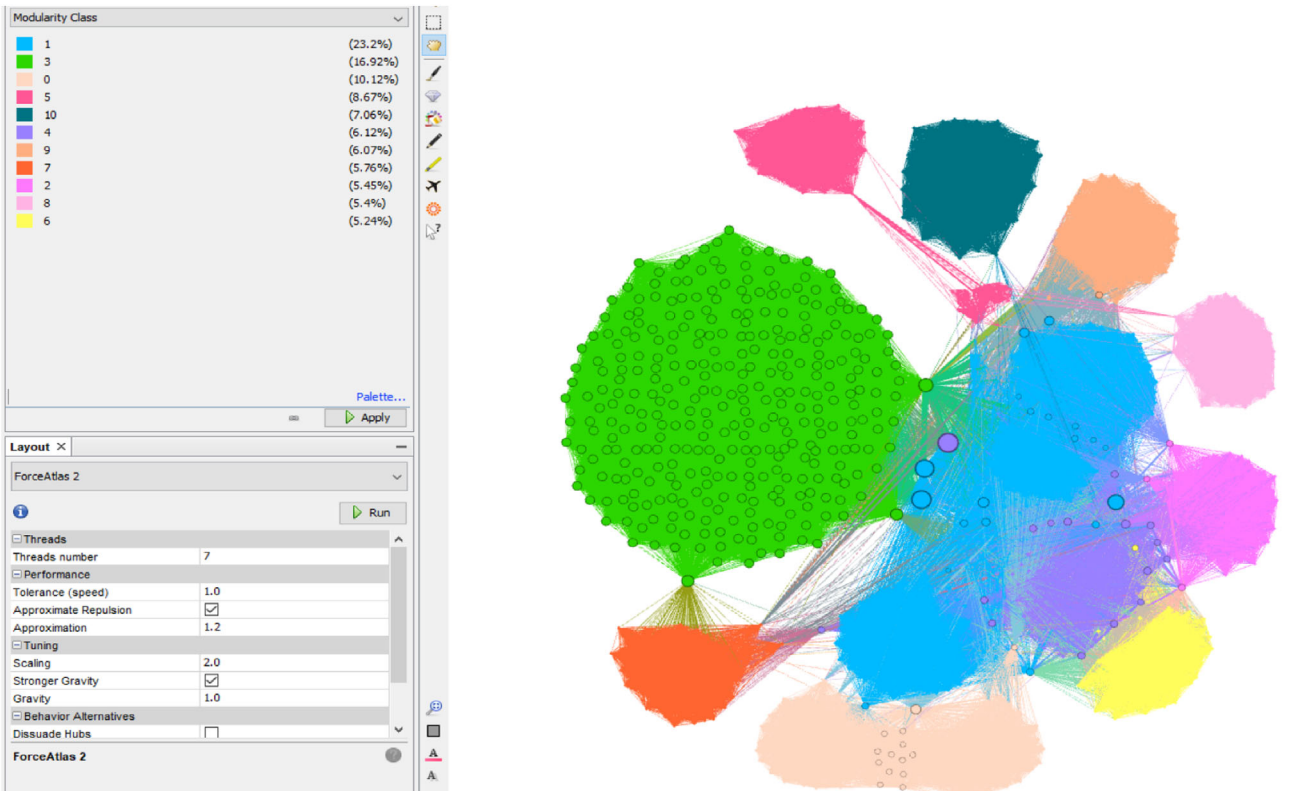
Next, we filtered the network using the degree range function in Gephi so that each emerging cluster would contain at least 100 nodes. If the number of papers within a cluster is too high (e.g., over 500), there is a chance that the cluster incorporates multiple themes and is not concentrated. On the contrary, when the number of nodes in a cluster is too low (e.g., less than 100), there is a chance that the cluster cannot converge to a specific theme. Thus, by experience, we

[1] https://gephi.org/

suggest a bottom threshold of 100 and a top threshold of 500 as a good criterion for forming clusters. Using a trial-and-error approach and an in-degree filter of 100, we extracted 11 clusters with a minimum of 100 nodes in each cluster and a maximum of 447 nodes (in cluster 2). Blondel, Guillaume, Lambiotte, and Lefebvre (2008) explain the underlying mechanism behind clustering analysis in Gephi. The modularity index of our cocitation network is 0.770, which is relatively high. This index shows that there is a strong connection between the nodes within a cluster, and that the clusters can be easily differentiated (modularity index varies between -1 and $+1$). Due to the high frequency of nodes in each cluster (i.e., the above 100 threshold), extracting themes of a cluster manually would have been challenging. We therefore conducted a word frequency analysis using NVIVO 12[2] for the qualitative data analysis to first understand the most frequent words mentioned in the article titles within each cluster. By searching the frequent keywords, discovering, and investigating the articles associated with these keywords, we came to a consensus regarding the main theme(s) that each cluster presents. For instance, in cluster 1, the most frequent words were "personality" (related to articles such as Paulhus and Williams (2002) and Schütte et al. (2016), "social psychology/cognition/behavior" (related to articles such as Lieberman (2007) and Strack and Deutsch (2004), and "supply/supplier" (related to articles such as DuHadway, Carnovale, and Kannan (2018) and Reimann, Kosmol, and Kaufmann (2017). This has led us to conclude that the main theme of this cluster is relevant to the study of behavioral risks in supply management. We further elaborate on this method by discussing each cluster individually in the next section. A screenshot of Gephi, along with the 11 clusters and their color coding, is presented in Figure 2. Naturally, we could not fit in the labels for the nodes of all clusters in Figure 2. To do this, we needed a high-resolution file so that readers could zoom in and read the labels. Therefore, these 11 clusters from the cocitation analysis of the SCRM papers are presented as a separate PDF file to this manuscript (see online Appendix A2). To understand the clusters' numbers in the online PDF file, the color palette indicator is included on the left-hand side in Figure 2. Furthermore, the detailed list of the articles in each cluster is also provided as another online supplementary information document in Excel format for this manuscript. Looking at the clusters in Figure 2 and online Appendix A2, it can be observed that some nodes are larger in size, compared to others. The size of the nodes is determined by the overall degree of the node (i.e., the number of edges connecting to the node). More specifically, the node size represents the frequency of the source being cocited; therefore, the larger a node, the more cocitations it has. This can imply the importance of the source in the literature due to its frequent cocitation. For instance, the article by Hendricks and Singhal (2005b) in cluster 4 or the article by Narasimhan and Talluri (2009) in cluster 3 are examples of such seminal studies in this field of study, and they are shown in online Appendix A2 as comparatively larger node sizes. Online Appendix A3 contains all of the clusters and their scholarly sources that we discuss in the next section.

[2] https://www.qsrinternational.com/

Figure 2: Screenshot of Gephi with the clusters from the cocitation analysis color-coded.



INTERPRETING CLUSTERS

Cluster 0: Behavioral Risks in Supply Management

Out of a total of 195 publications in cluster 0, *JSCM* (18 articles), *AMJ* (17 articles), and *Journal of Operations Management* (15 articles) contain the highest frequency of publications in this cluster. Looking at the extant publications in this cluster, the first major theme involves trust, power, and their role in buyer–supplier relationships. For example, in one of the earlier empirical works, Benton and Maloni (2005) investigate how the power balance between the buyer and the supplier affects supplier satisfaction and performance. Continuing on this line of research, Terpend and Ashenbaum (2012) study various types of power (e.g., coercive, referent, expert, and legitimate) and their effect on supplier performance. They also take into account the moderating role of supplier network size on the relationship among trust, power, and supplier performance. Handley and Benton (2012) empirically test the impact of practicing power on suppliers and their opportunistic behavior. They find that while expert and referent power reduce opportunistic behavior, rewards and coercive and legitimate power have an opposite impact on opportunistic behavior.

Another emerging theme in this cluster specifically focuses on supply managers' cognition and its impact on making decisions. For instance, Reimann et al. (2017) study managerial cognition and its role in their response to supplier-induced disruptions. They find support for the role of cognitive processes in explaining heterogeneity in organizational-level supply risk management. On the other hand, DuHadway et al. (2018) focus on communicating supply risk with organizational decision-makers and the impact of this communication on their risk perceptions and decision-making strategies. They specifically report on how decision-makers adjust their sourcing strategies and make more or less risky decisions when they are informed of supply chain risk levels. Supplier retention after disruption is another example of a behavioral role-play study conducted by Polyviou, Rungtusanatham, Reczek, and Knemeyer (2018). They show how a supply manager (referred to as a recovery lead in their study) decides on supplier retention based on perceived culpability and anger by supply managers toward the supplier.

The overriding methodology in cluster 0 is case analysis and qualitative research for theory building. Experimental analysis and especially role-play experiments are also used. Furthermore, some of the most cited behavioral frameworks by the papers in this cluster are associated with the literature on personality, power, and social psychology. Table 3 contains examples of all of the above, including examples relevant to OSCM papers in this cluster, along with relevant theoretical and methodological papers. We also include a column containing the top five most frequent journals mentioned in each cluster.

Another important feature of Table 3 involves classifying the themes of each cluster into three groups of *Matured (M)*, *Developing (D)*, and *Emerging (E)*. The few themes in Table 3 that are labeled as *Matured* are topics where most publications on them occurred in 2000–2010; these articles do not represent active, ongoing published works in the selected journals after 2010. *Developing* themes, on the contrary, concern topics that have maintained an active and high-frequency publishing profile throughout 2000–2010 and after 2010. Finally, *Emerging* themes

Table 3: Breakdown of clusters to their main themes and relevant OSCM, theory, and methodology scholarly sources.

Cluster	Theme (Matured (M)/ Developing (D)/Emerging (E))	Relevant Selective OSCM Articles	Main Informing Theoretical Articles	Main Informing Methodological Articles	Top Five Journals with Most Frequent Publications per Cluster
0	Trust and power issues in buyer–supplier relationships (D)	Benton and Maloni (2005), Handley and Benton Jr (2012), Terpend and Ashenbaum (2012), Zhao, Huo, Flynn, and Yeung (2008), Pulles, Veldman, Schiele, and Sierksma (2014)	*Power*: French and Raven (1959) Hunt and Nevin (1974) *Social psychology*: Lieberman (2007) and Strack and Deutsch (2004) *Personality*: Paulhus and Williams (2002) Schütte et al. (2016)	*Qualitative research*: Patton (2002) Flyvbjerg (2006) Corbin and Strauss (2008) Bansal and Corley (2011) Gioia, Corley, and Hamilton (2013)	• *Journal of Supply Chain Management* (18) • *Academy of Management Journal* (17) • *Journal of Operations Management* (15) • *Strategic Management Journal* (10) • *Journal of Business Logistics* (8)
	Cognitive risks in supply decisions (E)	Eckerd, Hill, Boyer, Donohue, and Ward (2013) Mir, Aloysius, and Eckerd (2017) Reimann et al. (2017) DuHadway et al. (2018) Polyviou et al. (2018)			

Continued

Table 3: Continued.

Cluster	Theme (Matured (M)/ Developing (D)/Emerging (E))	Relevant Selective OSCM Articles	Main Informing Theoretical Articles	Main Informing Methodological Articles	Top Five Journals with Most Frequent Publications per Cluster
1	Supply chain risk assessment (D) Supply chain risk mitigation (D) Sustainability issues in SCRM (E)	Neiger, Rotaru, and Churilov (2009) Ellis, Henry, and Shockley (2010) Hult et al. (2010) Ellis et al. (2011) Tazelaar and Snijders (2013) Tomlin (2006) Craighead et al. (2007) Braunscheidel and Suresh (2009) Knemeyer et al. (2009) Wang et al. (2010) Foerstl et al. (2010) Reuter, Foerstl, Hartmann, and Blome (2010) Hofmann et al. (2014) Touboulic, Chicksand, and Walker (2014) Foerstl et al. (2015)	*Risk perception and risk taking*: Slovic (1987) March and Shapira (1987) Thaler et al. (1997) *Behavioral operations theory*: Gino and Pisano (2008) *Decision making under risk*: Kahneman and Tversky (1979) Busemeyer and Townsend (1993) *Stakeholder theory* Donaldson and Preston (1995)	*Case study research*: Eisenhardt (1989) McCutcheon and Meredith (1993) Meredith (1998) Stuart, McCutcheon, Handfield, McLachlin, and Samson (2002)	• *Journal of Operations Management* (55) • *Decision Sciences* (28) • *Journal of Supply Chain Management* (22) • *Journal of Business Logistics* (18) • *Academy of Management Review* (14)

Continued

Table 3: Continued.

Cluster	Theme (Matured (M)/ Developing (D)/Emerging (E))	Relevant Selective OSCM Articles	Main Informing Theoretical Articles	Main Informing Methodological Articles	Top Five Journals with Most Frequent Publications per Cluster
2	Business continuity and resilience management (D)	Mendonça (2007) Elliott, Swartz, and Herbane (2010) Ambulkar et al. (2015) Sheffi (2015) Bode and Macdonald (2017)	*Institutional theory*: Zsidisin et al. (2005)	*Quantitative research*: Bollen and Stine (1990) Lindell and Whitney (2001) Preacher and Hayes (2008)	• *Journal of Operations Management* (9) • *Academy of Management Journal* (4) • *Decision Sciences* (4) • *Journal of Marketing* (3) • *Academy of Management Review* (2)
3	Behavioral newsvendor risk (D) Behavioral forecasting risk (E)	Schweitzer and Cachon (2000) Su (2008) Moritz et al. (2013) Nagarajan and Shechter (2014) Long and Nasiry (2015) Özer et al. (2011) Kremer et al. (2011) Kremer et al. (2016) Grushka-Cockayne et al. (2017)) Scheele et al. (2018)	*Decision biases and heuristics*: Tversky and Kahneman (1974) Tversky and Kahneman (1985) Kahneman, Knetsch, and Thaler (1991) *Decision-making under risk*: Kahneman and Tversky (1979) Sitkin and Weingart (1995) *Behavioral operations theory*: Gino and Pisano (2008)	*Behavioral experiment*: Podsakoff, MacKenzie, Lee, and Podsakoff (2003) Bachrach and Bendoly (2011) Knemeyer and Naylor (2011) Siemsen (2011)	• *Management Science* (59) • *Production and Operations Management* (54) • *Journal of Operations Management* (49) • *Journal of Supply Chain Management* (26) • *Decision Sciences* (12)

Continued

Table 3: Continued.

Cluster	Theme (Matured (M)/ Developing (D)/Emerging (E))	Relevant Selective OSCM Articles	Main Informing Theoretical Articles	Main Informing Methodological Articles	Top Five Journals with Most Frequent Publications per Cluster
4	Supply chain stock market performance (M) Justice and fairness in buyer–supplier relationship performance (D)	Hendricks and Singhal (2005b) Hendricks and Singhal (2005a) Hendricks et al. (2009) Griffith et al. (2006) Wagner et al. (2011) Liu et al. (2012) Narasimhan et al. (2013)	*Organizational justice and fairness*: Thibaut and Walker (1975) Bies (1986) Colquitt (2001)	*Quantitative research*: Preacher and Hayes (2004) Edwards and Lambert (2007) Preacher, Zyphur, and Zhang (2010)	• *Journal of Operations Management* (14) • *Academy of Management Journal* (8) • *Strategic Management Journal* (7) • *Decision Sciences* (6) • *Journal of Applied Psychology* (6)
5	Inventory/risk pooling (D) Dual sourcing (D) Operations and order diversification (D) Contracting (D) Hedging and insurance (D)	Corbett and Rajaram (2006) Berman et al. (2011) Tomlin and Yimin (2005) Wang et al. (2010) Yang et al. (2012) Babich et al. (2007) Yang et al. (2012) Swinney and Netessine (2009) Kalkanci et al. (2011) Kouvelis and Zhao (2012) Chod et al. (2010) Dong and Tomlin (2012) Turcic et al. (2015)	N/A	N/A	• *Management Science* (26) • *Manufacturing and Service Operations Management* (25) • *Production and Operations Management* (14) • *Journal of Operations Management* (11) • *Operations Research* (10)

Continued

Table 3: Continued.

Cluster	Theme (Matured (M)/ Developing (D)/Emerging (E))	Relevant Selective OSCM Articles	Main Informing Theoretical Articles	Main Informing Methodological Articles	Top Five Journals with Most Frequent Publications per Cluster
6	Resource-dependence risk (E)	Skilton (2014) Kim and Henderson (2015) Kull and Ellis (2016)	*Resource-dependence theory*: Casciaro and Piskorski (2005) Hillman, Withers, and Collins (2009) Drees and Heugens (2013) *Power dependence*: Emerson (1962) Casciaro and Piskorski (2005)	N/A	• *Journal of Operations Management* (8) • *Journal of Financial Economics* (6) • *Strategic Management Journal* (6) • *Administrative Science Quarterly* (5) • *Journal of Business Logistics* (5)
7	Public-private partnership and disaster relief management (D)	Stewart Geoffrey, Kolluru, and Smith (2009) Kovács and Tatham (2011) Day et al. (2012) Swanson and Smith (2013) McCarter and Fudge Kamal (2013)	*Resource-based view*: Olavarrieta (1997) Makadok (2001) Priem and Butler (2001)	N/A	• *Journal of Business Logistics* (12) • *Journal of Humanitarian Logistics and Supply Chain Management* (8) • *Journal of Marketing* (7) • *International Journal of Physical Distribution and Logistics Management* (6) • *Strategic Management Journal* (4)

Continued

Table 3: Continued.

Cluster	Theme (Matured (M)/ Developing (D)/Emerging (E))	Relevant Selective OSCM Articles	Main Informing Theoretical Articles	Main Informing Methodological Articles	Top Five Journals with Most Frequent Publications per Cluster
8	Supply network complexity risks (D)	Choi and Krause (2006) Pathak, Day, Nair, Sawaya, and Kristal (2007) Bozarth et al. (2009) Skilton and Robinson (2009) Jacobs and Swink (2011)	*Complexity theory*: Anderson (1999) Dooley and Ven (1999) Burnes (2005)	*Quantitative research*: King, Tomz, and Wittenberg (2000) Cohen, West, and Aiken (2003) Hoetker (2007) DeVellis (2016)	• *Journal of Operations Management* (14) • *International Journal of Physical Distribution and Logistics Management* (5) • *Organization Science* (5) • *Academy of Management Journal* (3) • *Journal of Supply Chain Management* (3)
	Disruptions management (D)	Kleindorfer and Saad (2005) Hendricks et al. (2009) Bode et al. (2011) Ellis et al. (2011) Chopra and Sodhi (2014)			
9	Intuition, expertise, and judgment models (E)	N/A	*Intuition*: Tversky and Kahneman (1983) Simon (1987) Dane and Pratt (2007) *Expertise*: Shanteau (1988) Ericsson and Smith (1991) Ericsson (2006) *Judgment*: Tversky and Kahneman (1974) Dawes, Faust, and Meehl (1989) Kahneman (2003)	N/A	• *Journal of Operations Management* (9) • *Organizational Behavior and Human Decision Processes* (4) • *Harvard Business Review* (3) • *Journal of Purchasing and Supply Management* (3) • *Psychological Bulletin* (3)

Continued

Table 3: Continued.

Cluster	Theme (Matured (M)/ Developing (D)/Emerging (E))	Relevant Selective OSCM Articles	Main Informing Theoretical Articles	Main Informing Methodological Articles	Top Five Journals with Most Frequent Publications per Cluster
10	Ant colony algorithm (M)	Morin, Gagné, and Gravel (2009) Yu, Yang, and Yao (2009) Bell and Griffis (2010)	*Ant algorithm*: Dorigo, Caro, and Gambardella (1999) Dorigo and Stützle (2003)	N/A	• *European Journal of Operational Research* (15) • *Journal of Business Logistics* (10) • *Transportation Science* (9) • *Computers and Operations Research* (5) • *Transportation Research Part E: Logistics and Transportation Review* (5)
	Tabu search heuristic (M)	Jaeggi, Parks, Kipouros, and Clarkson (2008) Pedersen, Crainic, and Madsen (2009) Kergosien, Lenté, Piton, and Billaut (2011)	*Tabu search*: Battiti and Tecchiolli (1994) Glover and Laguna (1998)		
	Simulated annealing (M)	Eglese (1990) Osman (1993) Briant, Naddef, and Mounié (2008)	*Simulated annealing*: Kirkpatrick, Gelatt, and Vecchi (1983) Henderson, Jacobson, and Johnson (2003)		
	Genetic algorithm (D)	He, Chang, Mi, and Yan (2010) Tang (2011) Wang and Chen (2012)	*Genetic algorithm*: Goldberg (1989) Reeves (2003)		

are determined by a significantly higher frequency of publications after 2010, compared to 2000–2010. Based on the emerging themes identified in Table 3, we form our discussions of future research directions in SCRM in the next section.

Cluster 1: Supply Chain Risk Assessment and Mitigation

Out of a total of 447 publications in cluster 1, *Journal of Operations Management* (55 articles), *Decision Sciences* (28 articles), and *JSCM* (22 articles) contain the highest frequency of publications in this cluster. Due to the high quantity of papers in this cluster, it became more complex for the cluster to converge into a particular theme. Upon carefully examining the papers in the aforementioned most frequent journals, the major themes in this cluster are associated with supply chain risk assessment and mitigation. For supply chain risk assessment, the literature is inclined toward *decision-making* about risks and is mostly behavioral in nature. For instance, Hult, Craighead, and Ketchen (2010) leverage real options theory to understand supply chain investment decisions under high-risk scenarios. Using this theory, they find that supply chain managers use real options in their investment decisions by being boundedly rational in these decisions. Ellis, Shockley, and Henry (2011) leverage enactment theory to understand the underlying processes of decision-making with regard to supply disruption risks through which these risks are perceived and acted on. Inspired by the *process-performance paradox*, Tazelaar and Snijders (2013) study how the expertise of OSCM professionals affects their decisions about supply risks. By differentiating general expertise from specialized expertise, they discover that while the former relies more on intuition, the latter is more certain regarding risk assessment decisions. They further discuss how this decision-making behavior affects their performance in assessing risks.

With respect to the risk mitigation literature, sources date back to the early 2000s and are primarily focused on the *mitigation capabilities* of supply chains. For instance, Craighead, Blackhurst, Rungtusanatham, and Handfield (2007) show how supply chain design characteristics (i.e., density, complexity, node criticality) increase the effect of supply chain disruption severity and how supply chain mitigation capability (i.e., recovery and warning) helps reduce this effect. Braunscheidel and Suresh (2009) investigate the antecedents of supply chain agility as a required capability to mitigate and manage risks in supply chains. They suggest that developing agility toward risk is a sequential process comprising organizational orientation (market and learning orientations) and organizational practices (internal integration, external integration, and external flexibility). To help improve supply chain risk mitigation capabilities, Knemeyer, Zinna, and Eroglu (2009) suggest a proactive planning framework composed of four main steps; namely, identify the key locations and threats, estimate the probabilities and losses for each key location, evaluate the alternative countermeasures for each key location, and select the countermeasures for each key location.

Finally, assessing and mitigating sustainability risks in supply chains is another stream of research in this cluster, which is primarily focused on environmental, social, and governance risks. While most papers in this cluster discuss the sustainability risks of suppliers and provide frameworks to manage these risks

(e.g., Foerstl, Reuter, Hartmann, & Blome 2010; Foerstl, Azadegan, Leppelt, & Hartmann, 2015), Hofmann, Busse, Bode, and Henke (2014) open a new debate on how sustainability-related supply chain risks turn into disruptions, and subsequently, how they should be managed. We elaborate on this emerging line of research in SCRM in the next section.

Qualitative, case study, quantitative, experimental, and mixed-methods research have all been referenced in this cluster. However, the most frequently cited research method involves case studies. The theoretical literature included in this cluster is diverse. Nevertheless, the most common theoretical frameworks mentioned in this cluster are associated with risk-taking behavior and risk perception, decision-making under risk, behavioral operations, and stakeholder theory.

Cluster 2: Business Continuity and Resilience Management

Out of 105 scientific publications included in cluster 2, the top three most frequently appearing journals are the *Journal of Operations Management* (nine articles), *AMJ* (four articles), and *Decision Sciences* (four articles). Looking at the articles in this cluster, while cluster 1 mainly revolves around proactive planning and risk mitigation, the dominant theme for this cluster concerns reactive responses to risk and ensuring business continuity through proper resilience management activities. Comparing clusters 1 and 2 in terms of the variety of topics discussed and the frequency of the sources, studies surrounding risk assessment and mitigation seem more enriched with a higher variety of topics covered than supply chain resilience and business continuity.

Some instances of relevant publications in this cluster include Ambulkar, Blackhurst, and Grawe (2015), where they explore ways through which firms can develop resilience. Using *resource reconfiguration* and *risk management infrastructure* as mediators, they discuss how such mediators affect firms in terms of developing resilience in high-/low-impact disruption contexts. In another example, Bode and Macdonald (2017) specifically focus on the antecedents of fast response to supply chain disruptions through decision-making processes. Using information processing theory, they investigate how *readiness*, *supplier dependence*, and *supply chain complexity* affect disruption impact throughout different response stages (i.e., recognition, diagnosis, development, and implementation).

There are not any dominant theoretical frameworks highlighted for this cluster except for an earlier work by Zsidisin, Melnyk, and Ragatz (2005), where institutional theory is leveraged to explain how regulating, validating, and habitualizing pressures have impacted upstream supply chain business continuity practices. Conceptual and quantitative methods are the common methodological approaches used in this cluster.

Cluster 3: Behavioral Operations and Supply Chain Risks

Out of a total of 326 publications in cluster 3, *MS* (59 articles), *POM* (54 articles), and *Journal of Operations Management* (49 articles) contain the highest frequency of publications in this cluster. The main theme for this cluster revolves around behavioral operations and their implications for supply chain risk. Among these

studies, the most popular topic involves the study of newsvendor risk from a behavioral lens. Building on the seminal work by Schweitzer and Cachon (2000), some of the behavioral models used for the newsvendor problem in this cluster are prospect theory (e.g., Ho, Lim, & Cui, 2010; Nagarajan & Shechter, 2014; Long & Nasiry, 2015; Uppari & Hasija, 2018), cognitive reflection (e.g., Moritz, Hill, & Donohue, 2013), overconfidence (e.g., Li, Petruzzi, & Zhang, 2017), bounded rationality (e.g., Su, 2008), and risk attitudes (e.g., Agrawal & Seshadri, 2000; de Véricourt, Jain, Bearden, & Filipowicz, 2013). A comprehensive review of behavioral operations studies for newsvendor risk is provided by Zhang and Siemsen (2019).

Another stream of research included in this cluster regards behavioral risks associated with forecasting. Behavioral issues in forecast information sharing (e.g., Özer, Zheng, & Chen, 2011; Scheele, Thonemann, & Slikker, 2018), judgment biases and judgmental forecasting (e.g., Kremer, Moritz, & Siemsen, 2011; Moritz, Siemsen, & Kremer, 2014; Seifert, Siemsen, Hadida, & Eisingerich, 2015; Kremer, Siemsen, & Thomas, 2016; Petropoulos, Kourentzes, Nikolopoulos, & Siemsen, 2018), and overconfident forecasting (e.g., Grushka-Cockayne, Jose, & Lichtendahl, 2017) are some examples of papers included in this cluster that investigate behavioral risks in forecasting.

Due to the behavioral nature of the articles in this cluster, behavioral experiments are naturally the preferred method of data collection. The main theoretical frameworks used for the studies in this cluster are relevant to behavioral models of biases and heuristics, decision-making under risk, and the theory of behavioral operations. More comprehensive discussions on the aforementioned topics are provided in a recent review paper by Fahimnia et al. (2019).

Cluster 4: Supply Chain Performance Risks

Out of a total of 118 publications in cluster 4, *Journal of Operations Management* (14 articles), *AMJ* (eight articles), and *Strategic Management Journal* (seven articles) contain the highest frequency of publications in this cluster. The main theme of this cluster revolves around performance risk in supply chains. One group of studies relevant to this theme involves earlier works that investigate the role of supply chain disruptions in stock price performance of firms in supply chains. In their seminal and highly cited article, Hendricks and Singhal (2005b) study the impact of supply chain disruptions on long-term stock prices and equity risks. They find that supply chain disruptions exacerbate both the stock prices and equity risks of firms. Another concurrent study by Hendricks and Singhal (2005a) investigates the impact of supply chain disruptions on operating performance criteria such as operating income, return on sales, and return on assets, which are all shown to be negatively affected by disruptions. They also find that supply chain disruptions decrease sales growth while increasing costs and inventories. In a subsequent study, Hendricks, Singhal, and Zhang (2009) empirically examine how the stock market reacts to supply chain disruptions. For their study, Hendricks et al. (2009) use variables such as operational slack, business/geographical diversification, and vertical relatedness. They find that while having more slack and vertical relatedness decreases negative reactions of

the stock market to disruptions, more geographical diversification has an opposite effect, whereas business diversification has no effect on the stock market reaction.

Another line of research in this cluster investigates the role of justice and/or fairness among buyer–supplier relationships and performance. For instance, Griffith, Harvey, and Lusch (2006) use social exchange theory to investigate the impact of procedural and distributive justice on supplier–distributor relationships. They find a positive relationship between the increased perceived justice by the distributor and its performance through decreased conflict and increased satisfaction. By integrating relationship theory, social exchange theory, and signaling theory, Wagner, Coley, and Lindemann (2011) empirically test the mediating role of trust and fairness on the impact of supplier reputation in buyer–supplier relationship performance. They find that trust has the strongest effect, compared with fairness and reputation, on the relationship between the buyer and the supplier. Narasimhan, Narayanan, and Srinivasan (2013) show that the procedural, distributive, and interactional aspects of justice are each individually important and impactful on buyer–supplier relationship performance. Thus, an increase in one aspect of justice cannot compensate for insufficiency in the other.

The main theoretical frameworks used in this cluster are associated with organizational justice and fairness. Empirical quantitative methods of analysis, and specifically survey analysis, have been the preferred data collection method.

Cluster 5: Supply Risk Management

Out of a total of 167 publications in cluster 5, *MS* (26 articles), *Manufacturing and Service Operations Management* (25 articles), and POM (14 articles) contain the highest frequency of publications in this cluster. The main emergent topic in this cluster revolves around managing, and more specifically, mitigating supply risk in supply chains. First, among the most important causes of supply risk in this cluster, there are instances that discuss the risks of asymmetric information distribution between buyers and suppliers (e.g., Yang, Aydin, Babich, & Beil, 2009; Kalkanci, Chen, & Erhun, 2011; Yang, Aydın, Babich, & Beil, 2012), unreliable suppliers, and excessive reliance of buyers on single supply sources (e.g., Tomlin & Yimin, 2005; Dada, Petruzzi, & Schwarz, 2007; Tomlin, 2009).

Second, the most referenced solutions to mitigate and/or manage the aforementioned supply risks have been risk/inventory pooling (Corbett & Rajaram, 2006; Berman, Krass, & Mahdi Tajbakhsh, 2011), dual sourcing (Tomlin & Yimin, 2005; Wang, Gilland, & Tomlin, 2010; Yang et al., 2012), operations and order diversification (Babich, Burnetas, & Ritchken, 2007; Yang et al., 2012), contracting (e.g., trade credit contracts, long-term contracts, price-only contracts, and quantity discount contracts) (Swinney & Netessine, 2009; Kalkanci et al., 2011; Kouvelis & Zhao, 2012), and hedging and insurance (Chod, Rudi, & Mieghem, 2010; Dong & Tomlin, 2012; Turcic, Kouvelis, & Bolandifar, 2015). There does not seem to be a preference for any of these supply risk mitigation methods in terms of the frequency of inclusion in this cluster.

Developing and testing analytical models appears to be the primary methodology among these studies. Furthermore, there is not a strong presence of using or building theory among these papers.

Cluster 6: Resource-Dependence Risk

Out of a total of 101 publications in cluster 6, *Journal of Operations Management* (eight articles), *Journal of Financial Economics* (six articles), and *Strategic Management Journal* (six articles) contain the highest frequency of publications in this cluster. The major topic of discussion in this cluster is associated with the risks and benefits of resource dependence across supply chains. For instance, Skilton (2014) investigates buyers' dependence on supplier resources. Given the bargaining power that resource dependence creates for suppliers, Skilton (2014) argues how buyers can structure their supply chains to reduce this power and create value. Kim and Henderson (2015) explore resource dependence in a customer–buyer–supplier triadic structure and its impact on buyer performance. Their findings show that the risks of supplier dependency versus customer dependency are not the same, and supplier dependency shows higher levels of economic benefits. In another example, Kull and Ellis (2016) demonstrate how buyers and logistics managers (through supplier cost analysis and supplier integration) can create value for their firm, even while being dependent on supplier resources. Other topics included in this cluster from the general management and finance journals revolve around interorganizational alliances, power dependence, and financial/credit risks. However, as the articles mentioned are not directly relevant to OSCM studies, we are not discussing them in this article.

Using archival data and conducting survey analyses are the most common data collection methods in this cluster. Moreover, resource-dependence and power-dependence theories are the main theoretical frameworks used to develop the studies in this cluster.

Cluster 7: Humanitarian Operations and Disaster Relief

Out of a total of 111 publications in cluster 7, *JBL* (12 articles), *Journal of Humanitarian Logistics and Supply Chain Management* (eight articles), and *Journal of Marketing* (seven articles) contain the highest frequency of publications in this cluster. The main research topic in this cluster revolves around humanitarian operations and disaster relief. Day, Melnyk, Larson, Davis, and Whybark (2012) enumerate the fact that despite an increase in the number of disasters affecting supply chains globally, the overall OSCM community has not paid much attention to the humanitarian and disaster relief field of research in supply chains. They therefore provide insights into the existing and emerging research areas that can contribute to this topic. Most of the research done in this area involves the logistics of humanitarian operations and disaster relief; specifically, the role of public–private partnerships in this domain has been frequently studied. For instance, Swanson and Smith (2013) use stakeholder theory to investigate how commercial organizations are motivated to take part in humanitarian logistics. They also evaluate four commercial logistics frameworks and their applicability to disaster management. In another example, McCarter and Fudge Kamal (2013) investigate the dynamics and psychological underpinnings of public–private partnerships and why some of them succeed, while others fail. By identifying the social dilemmas arising in such partnerships, they provide a number of strategies (i.e., trust, self-efficacy, and social responsibility) to tackle these dilemmas. There have been a variety of theories

applied to the studies in this cluster; however, the most commonly leveraged theoretical framework is the resource-based view. While there are not many methodological publications mentioned in this cluster, developing conceptual frameworks and conducting empirical quantitative analyses seem to be the most common research methods.

Cluster 8: Supply Network Complexity and Disruptions Management

Out of a total of 104 publications in cluster 8, *Journal of Operations Management* (14 articles), *International Journal of Physical Distribution and Logistics Management* (five articles), and *Organization Science* (five articles) contain the highest frequency of publications in this cluster. Supply chain and supply network complexity, alongside managing disruptions in supply chains, are the main theme of this cluster. Choi and Krause (2006) study the impact of reducing supply chain complexity on transaction costs, supply risk, supplier responsiveness, and supplier innovation. Their findings show that while reducing complexity might decrease transaction costs and improve supplier responsiveness, it does not necessarily reduce supply risk and might also reduce supplier innovation. Bozarth, Warsing, Flynn, and Flynn (2009) show that supply chain complexity (upstream, organizational, and downstream complexity) negatively impacts plant performance. They study complexity in terms of dynamic and detail complexity, and they investigate the impact of each on plant performance. Examples of more recent studies on disruption management include a review by Ellis et al. (2011), which provides a comprehensive framework for supply disruption and the risk decision-making process using enactment theory. Using information processing and resource-dependence theories, Bode, Wagner, Petersen, and Ellram (2011) answer the question: "Why, how, and under what conditions do firms respond to supply chain disruptions?" Their findings show that supply chain responses to risks are based on past experiences evolving into *stability motives* and *interpretive postures*.

Out of the variety of theories cited in this cluster, complexity theory is the most common. Empirically oriented quantitative and multiple regression analyses seem to be the most popular methods used by the articles in this cluster.

Cluster 9: Intuition and Expertise in Risk Management Decisions

Out of a total of 117 publications in cluster 9, *Journal of Operations Management* (nine articles), *Organizational Behavior and Human Decision Processes* (four articles), and *Harvard Business Review* (three articles) contain the highest frequency of publications in this cluster. The dominant theme for this cluster involves behavioral studies on intuition, expertise, and judgment. However, we could not find any relevant OSCM articles that directly use these behavioral issues on the topic of managing risk in supply chains. We have extracted a list of sources from this cluster on the aforementioned behavioral topics, and we elaborate on the implications of such behavioral models for the supply chain risk literature in the next section.

Cluster 10: Metaheuristics and Logistics Risk Management

Out of a total of 136 publications in cluster 10, *European Journal of Operational Research* (nine articles), *JBL* (10 articles), and *Transportation Science* (nine

articles) contain the highest frequency of journal publications in this cluster. The main topic of this cluster revolves around using heuristic and metaheuristic models in optimization and routing problems. The main optimization and analytical models considered for these studies in this research include the *ant colony algorithm*, *Tabu search heuristic*, *simulated annealing*, and *genetic algorithm*.

As this topic is not directly relevant to the general supply chain risk literature and is primarily focused on *OR*, we do not elaborate much on the studies in this cluster. However, we enumerate examples of papers using the aforementioned heuristic models in Table 3.

DISCUSSION: EMERGING DEBATES AND TOPICAL AREAS IN SCRM

Looking at our cluster analyses and the categorization of themes into matured, developing, and emerging, we elaborate in this section on the emerging themes, namely *Sustainability issues in SCRM*, *Cognitive risks in supply decisions*, *Behavioral forecasting risk*, *Resource dependence risk*, and *Intuition, expertise, and judgment models*. To discuss these emerging themes, we categorize them into two major groups of *Sustainable SCRM* and *Behavioral SCRM;* we further elaborate on possible research opportunities for each theme. In addition, we introduce a supplementary subsection, where we build on our findings from cluster analyses to propose possible methodological and theoretical frameworks that are a good fit for SCRM studies, but have so far not been widely adopted.

Sustainable SCRM

There exists an ongoing discussion surrounding how sustainability-related supply chain risks and disruptions should be categorized. The sustainable SCRM literature positions risk into three primary camps: environmental (Ukidwe & Bakshi, 2005; Simpson, Power, & Samson, 2007), social (Klassen & Vereecke, 2012), and governance (Gualandris, Klassen, Vachon, & Kalchschmidt, 2015). Recent studies have started drilling down into these categories to identify potential subcategories for exploration, such as modern slavery (New, 2015) among social issues or how specific policies impact the supply base and subsequent subtier (Villena, 2019). Moreover, steps are being taken to operationalize the impact of sustainability-related supply chain disruptions (Kim, Wagner, & Colicchia, 2019), alongside identifying the risks associated beyond the supply base at the subtier level (Villena & Gioia, 2018). It would seem that the next steps, some of which have already been taken, fall under the umbrella of better understanding how to manage sustainable SCRM beyond the supply base, and perhaps how the subtier and the entire supply network can be evaluated, influenced, and developed by buying firms.

While risk management principles and portfolio theory have been applied across traditional SCRM platforms, less discourse has been articulated on this particular debate regarding risk management strategies when considering sustainability. Arguments have been made in the context of supplier relationships (Bode et al., 2011) and supplier-related risk management strategies (Hajmohammad &

Vachon, 2016). Yet, empirical evidence supporting "how" firms manage their portfolio of sustainable supply chain risks, and which particular risks gain traction or salience among those that do not, may be an interesting area for future debate and study. Research looking into the specific sustainability-related tensions that exist between buying firms and suppliers is gaining traction (Xiao, Wilhelm, van der Vaart, & van Donk, 2019). For example, Goebel, Reuter, Pibernik, Sichtmann, and Bals (2018) discuss the particular attributes of sustainability that purchasing officers are willing to pay for. Porteous, Rammohan, and Lee (2015) discuss approaches for managing supplier compliance. That said, do stakeholders view wage theft similarly to deforestation in terms of supplier-related incidents? Also, does this bifurcation potentially create a "slippery slope" effect, where seemingly small events may potentially propagate or snowball into larger issues down the road?

Behavioral SCRM

While the literature on behavioral OSCM is quite rich, incorporating behavioral models within the SCRM literature is quite novel and an emerging topic of study (Fahimnia et al., 2019). Looking at the original pool of 118 SCRM articles (see online Appendix A1), it can be understood that incorporating behavioral models into the identification, assessment, and overall management of risk is still limited, but certainly growing. To summarize our findings from behavioral studies relevant to SCRM in our cluster analyses, we find that these studies so far revolve around risks associated with power and trust issues between buyers and suppliers (e.g., Benton & Maloni, 2005; Handley & Benton, 2012; Terpend & Ashenbaum, 2012), supply managers' cognition and its impact on making supply decisions (e.g., Reimann et al., 2017; DuHadway et al., 2018; Polyviou et al., 2018), decision-making under risk in response to supply chain disruptions (e.g., Hult et al., 2010; Ellis et al., 2011; Tazelaar & Snijders, 2013), behavioral risks in supply chain inventory management (e.g., Croson & Donohue, 2006; Croson, Donohue, Katok, & Sterman, 2014), behavioral risks in supply chain forecasting (e.g., Kremer et al., 2016; Grushka-Cockayne et al., 2017; Scheele et al., 2018), and the impact of fairness and justice (or the lack thereof) regarding perceptions on buyer–supplier relationships and performance (e.g., Wagner et al., 2011; Liu, Huang, Luo, & Zhao, 2012; Narasimhan et al., 2013). More specifically, we find a number of emerging fields of study in the clusters, i.e., *Cognitive risks in supply decisions*, *Behavioral forecasting risk*, *Resource dependence risk*, and *Intuition, expertise, and judgment models*, which can further inform behavioral SCRM topics. As per our discussions in each cluster, the aforementioned clusters comprise a variety of behavioral models, from managerial cognition and their perceptions of risk in supply decisions, to judgment biases and overconfidence in forecasting, and the power imbalance and resource dependence between buyers and suppliers that might affect interorganizational relationships and, therefore, risks. However, one less explored area regards the impact of intuition and expertise in the overall SCRM literature. Although intuition and expertise have been argued to be pivotal factors in affecting and/or enhancing supply chain decision-making (Carter, Kaufmann, & Wagner, 2017), the general supply chain literature, and more

specifically the SCRM literature, lacks studies on how these two concepts affect decisions with respect to risk and risk management in supply chains. In fact, the only relevant study we can find on this topic is the aforementioned study by Tazelaar and Snijders (2013) in cluster 1. The SCRM and OSCM literature overall seem to be lagging behind the general management literature in terms of addressing how intuition, expertise, and *fast and frugal heuristics* (Gigerenzer & Goldstein, 1996) can, in fact, be an asset and help with decision-making, especially under uncertainty and risk. The SCRM literature has so far primarily focused on the *dark side* of heuristics, where heuristics and biases are considered as only having adverse impacts on decision-making. Fortunately, this concern has been addressed in the supply chain literature in general (Katsikopoulos & Gigerenzer, 2013; Petropoulos et al., 2018) and is starting to gain momentum among supply chain scholars.

While we encourage future studies to continue the debate on any of the aforementioned line of studies on behavioral OSCM and SCRM, we would like to suggest additional avenues for research in this domain. For instance, using behavioral models such as bounded rationality (Simon, 1972) or attitudes toward decision-making under risk (Kahneman & Tversky, 1979; Thaler, Tversky, Kahneman, & Schwartz, 1997), researchers can explore how supply chain risks are identified and prioritized. One interesting branch of research that can arise from this topic involves differentiation between the types of risks (e.g., high- vs. low-impact risks, sustainability vs. nonsustainability risks) and how they are perceived and assessed by decision-makers. In a similar vein, responses to supply chain risks can vary, depending on numerous behavioral patterns that supply chain decision-makers can adopt. For instance, how would a risk-averse versus a risk-seeking supply chain executive react to certain types of risk? Is a risk-averse decision-maker more inclined toward risk mitigation and a risk-seeking decision-maker more inclined toward risk acceptance? Moreover, what would be the tangible consequences of such decisions for supply chains? As can be seen from only these two examples, the possibilities and opportunities to conduct impactful research in this domain are abundant. While the literature in Organization Studies has so far offered numerous studies at the organizational level for addressing the decision processes and psychological aspects of attitudes toward risk and risk-taking behavior (e.g., Miller & Chen, 2004; Shimizu, 2007; Shipilov, Godart, & Clement, 2017), these studies can certainly be foundations to expand the ideas and behavioral models in them within the context of SCRM.

Emerging Methodologies and Theoretical Frameworks

Analytical and empirical methods are still quite prevalent; yet, we have witnessed more conceptual pieces surfacing in recent years. In terms of the methods leveraged, designing experiments and utilizing archival data have become more commonplace alongside multimethod approaches—which are seemingly becoming the norm instead of the exception for top journals. More rarely, field study (Sodhi, Son, & Tang, 2012) and event study (Kim et al., 2019) methodologies have been employed. That said, while the cocitation analysis revealed some examples, we did not discover among the 118 studies any that implemented

action research methods. From the extant SCRM literature covered, this may be a viable approach for understanding how to institute or direct positive change within an organization in terms of managing supply chain risks or otherwise.

While there were many examples of multimethod (e.g., leveraging simulation and analytical modeling, regression and SEM, etc.) and multidata (e.g., utilizing survey and archival data, survey and interview data, etc.) articles, mixed-methods works were less frequent (10 observations). Of these 10 articles, using interview or case data alongside quantitative methods was prevalent. For example, much more recently, fuzzy-set qualitative comparative analysis (fsQCA) has been employed to bridge the gap between case-oriented (e.g., firm reports, interview data, etc.) and quantitative methods (Reimann et al., 2017; Azadegan, Mellat Parast, Lucianetti, Nishant, & Blackhurst, 2019; Timmer & Kaufmann, 2019). Alternatively, mixing analytical and quantitative approaches has been utilized in supply network risk (e.g., computational modeling and network analysis) and ordering behavior (order modeling and experimental design) to provide robust findings (Basole & Bellamy, 2014; Gurnani, Ramachandran, Ray, & Xia, 2014). That said, we could not locate any bridging between qualitative methods and analytical modeling. Perhaps case studies or interview data could be leveraged to help build platforming for future model building and testing.

With respect to SCRM, strides have been made in advancing the boundary conditions associated with multiple theories. That said, we noticed some theories leveraged less commonly that might be of interest for future research. For example, competing values theory (e.g., see Gabler, Richey, & Stewart, 2017) highlights organizational tensions that exist between the states of stability/control and flexibility/adaptability. Given the increasingly ambidextrous expectations of firms, future research might leverage this theory to expound upon the competencies required for understanding and managing SCSRs in both the short and long term. Cluster theory (Habermann, Blackhurst, & Metcalf, 2015) has been leveraged to explain supply chain risk mitigation through colocation activities versus traditional supplier dispersion techniques, which propagates an interesting debate surrounding supply chain design strategies. Auction theory (Chaturvedi & Martínez-de-Albéniz, 2011; Huang, Li, & Xu, 2018) provides insight into supplier bidding design and how supply risks and information costs play a role. Perhaps there may be other factors influencing this process.

The cocitation analysis revealed a plethora of articles leveraging theories that were not utilized among the extant 118 papers discussed. For example, the cognitive view (e.g., see Barnett, 2014) may provide insights into how, where, and why stakeholder position salience matters in terms of supply chain risks, particularly those with sustainable underpinnings. Along similar lines, from psychology, self-determination theory (Deci & Ryan, 2012) and construal level theory (Trope & Liberman, 2010) may provide evidence supporting the tensions facing decision-makers when considering risk management practices. Along with the grounded theory articles, arguments could be made in which supply chain scholars could perhaps discover and/or develop a theory specific to the supply chain field, such as a sort of "supply chain risk" theory.

SUPPLY CHAIN RISK MANAGEMENT DURING AND AFTER THE COVID-19 ERA

Looking at the cluster analyses we discussed earlier, the collective frequency of publications, variety of topics, and publication dates all indicate that more emphasis is put on risk assessment and risk mitigation studies, compared with supply chain resilience and disruption management publications. Although there have been notable efforts made to highlight the importance of topics such as supply chain disaster relief management (Day et al., 2012) or developing scales for firm resilience to supply chain disruptions (Ambulkar et al., 2015), similar studies have been scarce in the general SCRM literature. The importance and simultaneous insufficiency of such studies have been highlighted after the COVID-19 pandemic, which has caused significant disruptions to the global economy, businesses, and supply chains. In the short term, there have been numerous efforts to gauge the impact of such disruptions to businesses and the future of supply chains through academic and thought leadership publications, seminars, and white papers, to name a few (Melnyk, Schoenherr, & Talluri, 2020; Renjen, 2020; Schoenherr, Talluri, & Verter, 2020). Nevertheless, we believe that these efforts should become systemic and should form a wholistic, yet in-depth view of supply chain resilience and disruption management.

To this end, we would like to draw attention to relevant studies in broader management disciplines such as Organizational Behavior, Strategic Management, and Organizational Theory and their implications for studies on supply chain resilience and disruption management. First, there needs to be a clear definition of the term *disruption*. Disruption in SCRM is referred to as an adverse event that disrupts the flows of goods or services in supply chains (Craighead et al., 2007). According to this definition, a minor machine breakdown and a pandemic, such as COVID-19, fall into the same category. However, there should be a clear differentiation between crises (low probability—high-impact events) (Pearson & Clair, 1998) and other types of disruptions with varied levels of impact/likelihood, as they require different responses and different kinds of recovery and resilience planning. Second, in managing crises, future SCRM studies should differentiate between crisis-as-an-event and/or crisis-as-a-process, as they have various short- and long-term implications for response and resilience management (Williams, Gruber, Sutcliffe, Shepherd, & Zhao, 2017). In the case of COVID-19, supply chains are experiencing a disruption to operations in a crisis-as-a-process context. Third, the SCRM literature should adopt a *multilevel* approach in studying resilience management, which incorporates individual, organization, supply chain, and stakeholder interconnections and their impact on supply chain resilience (van der Vegt, Essens, Wahlström, & George, 2015; Bundy, Pfarrer, Short, & Coombs, 2017). Recent shortages of personal protective equipment and ventilators globally, as well as the (un)successful policies and immediate responses of some governments and the public in helping healthcare supply chains secure health equipment, testify to the importance of adopting such a multilevel approach. Moreover, government interventions (e.g., requesting firms to produce some of the aforementioned health-related equipment) further complicate supply chain responsiveness and coordination, thereby adding another layer of risk (Darby, Ketchen, Williams, & Tokar,

2020). Finally, the SCRM literature needs to convey a more realistic picture of resilience. While the majority of the SCRM literature has focused on the advantages of developing resilient operations, the *cost* of supply chain resilience is often ignored (van der Vegt et al., 2015). Increasing a supply chain's resilience to crises through activities such as buffer inventories, excess capacity, and supplier flexibility bears noticeable levels of cost that need to be justified. Oftentimes, justifying the costs of increasing resilience is challenging and for a good reason; first, in complex and extended global supply chains, it is not easy to identify those critical nodes that should be targeted specifically for increased redundancy. Moreover, power and control issues and conflicting objectives in dictating redundancy and flexibility in buyer–supplier relationships are hindering improvements with respect to resilience in supply chains. Thus, we suggest that future SCRM studies consider both the *bright and dark sides* of supply chain resilience amongst crises.

Here, we have only scratched the surface of what future directions might look like concerning research in resilience and crisis management during and after the COVID-19 era. We encourage OSCM scholars to explore and build on these ideas further, and especially avoid fragmented and isolated islands of research in this domain.

CONCLUSION

In this review, we adopted three lenses of looking at past, present, and future research in SCRM. Focusing on a selective set of prestigious OSCM journals, we leveraged a bibliometric analysis to identify the major authors, methods, and theoretical frameworks used thus far in the SCRM literature. Through a cocitation analysis, we revealed, interpreted, and thematically labeled 11 major clusters. In addition to categorizing, we also labeled each theme as matured, developing, or emerging based on the frequency and timeline of the extant publications. We further elaborated on the research opportunities regarding the identified emerging themes, namely, sustainable SCRM, behavioral SCRM, and emerging methodologies and theoretical frameworks. Overall, our findings show that the SCRM literature is going through a transition: in addition to the traditional discussions on operational risk management, the unique nature of behavioral, as well as sustainability-related supply chain risks are explored. Furthermore, we predict that multimethodological approaches will be gaining increased attention and application in SCRM studies. This is primarily due to the nature of behavioral studies, which require multimethod approaches to developing analytical models and collecting data (e.g., using controlled lab experiments or other empirical methods such as surveys and interviews). This is also due to the inclination of the journals we investigated toward multimethod approaches. To capture the realities and the true nature of risk in supply chains, and more importantly, the reactions of supply chain decision-makers and other stakeholders to such risks, as well as supply chain disruptions, we further encourage operations and supply chain scholars to consider the numerous possibilities of conducting research in the identified emerging fields in this article.

Limitations

Our focus in this study has been on a limited set of journals in OSCM, as well as the *AMJ*. While this selection has been deliberate in terms of reflecting on the SCRM literature published in outlets that are considered as prestigious by various journal rankings such as the FT 50 and UT Dallas lists, it is reasonable to argue that such a selection might not be representative regarding the remainder of outlets in this field in terms of producing a more significant volume of publications in SCRM studies. While this is a valid argument, we can also argue that such a selection might be looked at as both a strength and caveat of our article. The strength of such a selection lies in the fact that research in such prestigious outlets usually informs the general direction of research in SCRM. The caveat of such a selection, in addition to the aforementioned coverage of the literature, relates to the cocitation analysis. There are possibly other clusters missing from our analysis that report on emerging topics, such as the adoption of advanced technologies in SCRM. While the latter comprises a growing body of knowledge in the general SCRM literature (e.g., Baryannis, Validi, Dani, & Antoniou, 2019; Ivanov, Dolgui, & Sokolov, 2019), it was not identified as a cluster in our cocitation analysis due to our focus on a selective set of journals. Furthermore, in our review, we did not include other prestigious journals in *Business, Management*, and *Social Sciences*, such as *Strategic Management Journal* or *Academy of Management Review*. This is because the *AMJ* had the most relevant publications in this domain, and out of all the management journals, it is the most read and cited. Finally, our analysis and labeling of the clusters were primarily subjective. Although we based our decisions on a word frequency analysis to name the clusters, there is the chance that we did not pick up on themes within the cluster(s) that might have also been an emerging theme. Considering this, we would like to encourage readers to review the online appendices (Appendix A3) and further explore such possibilities.

Implications for Practice

Since we started working on this project in late 2019, the world has been struggling with the COVID-19 pandemic, which has caused significant disruptions to supply chains, businesses, societies, and our overall way of life as we know it. As we draft this manuscript, there is no short-term solution envisaged for this crisis, and governments and businesses are primarily coping reactively with the consequences of this outbreak. We therefore turned to our analyses of the SCRM clusters, and it is unfortunately apparent that little attention has been given to studies on business continuity and resilience management (cluster 2) or humanitarian operations and disaster relief (cluster 7), compared to other more popular SCRM topics. In fact, at the beginning of our discussions in cluster 7, we discussed how current attention to the aforementioned topics has been insufficient so far. It is also surprising to see that we could hardly find publications in our clusters or in our pool of articles on pandemics, epidemics, or specific keywords associated with the names of previous pandemics such as SARS, Ebola, etc. This has led us to propose the following questions: *How much are the current scholarly efforts on SCRM topics aligned with the reality of our societies and businesses? Should we rethink our priorities in SCRM studies?* Naturally, there have been and will be calls for papers and

special issues on COVID-19, its consequences, and how it could have been better managed. However, the question still remains open: *How can we ensure that our research in SCRM can predict such crises in advance, and how can we equip businesses and governments with a sufficient knowledge base so that they will be ready to face such crises?*

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Online Appendix A1. The reference pool of 118 SCRM articles from the nine selected journals (Microsoft Excel file)
Online Appendix A2. Cocitation clusters with labels (PDF file)
Online Appendix A3. A list of clusters and their scholarly sources (Microsoft Excel file)

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APPENDIX

THE SCOPUS SEARCH ALGORITHM

TITLE-ABS-KEY ("supply chain risk" OR "Operations risk" OR "supply chain vulnerability" OR "supply chain resilience" OR "supply risk" OR "sustainability risk" OR "supply chain disruption" OR "supplier risk") AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re") AND (LIMIT-TO [SUBJAREA, "BUSI"] OR LIMIT-TO [SUBJAREA, "DECI"]) AND (EXCLUDE [PUBYEAR, 2020]) AND (LIMIT-TO [EXACTSRCTITLE, "Decision Sciences"] OR LIMIT-TO [EXACTSRCTITLE, "Journal Of Business Logistics"] OR LIMIT-TO [EXACTSRCTITLE, "Management Science"] OR LIMIT-TO [EXACTSRCTITLE, "Operations Research"] OR LIMIT-TO [EXACTSRCTITLE, "Academy Of Management Journal"] OR LIMIT-TO [EXACTSRCTITLE, "Journal Of Supply Chain Management"] OR LIMIT-TO [EXACTSRCTITLE, "Production And Operations Management"] OR LIMIT-TO [EXACTSRCTITLE, "Manufacturing And Service Operations Management"] OR LIMIT-TO [EXACTSRCTITLE, "Journal Of Operations Management"]).

Mehrdokht Pournader received the PhD degree from Macquarie University. She is a senior lecturer (i.e., associate professor) of operations and supply chain management and a senior academic adviser at the University of Melbourne. Her research interests are in risk management and behavioral models for risk preferences in supply chains and operations. Her work has been published at *Journal of Business Ethics*, *International Journal of Production Research*, and elsewhere.

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