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METHODOLOGY

Guidelines for Bibliometric-Systematic Literature Reviews: 10 steps to combine analysis, synthesis and theory development

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Abstract

The steady increase in academic production has been paralleled by a surge in the number of bibliometric and systematic literature reviews (SLRs) published. Over the years, scholars began to combine bibliometric analyses with SLRs. However, such combined approaches relied on fragmented methodological suggestions without clear guiding frameworks. This article introduces integrated guidelines for undertaking multi-method literature reviews, combining bibliometric analyses with SLRs and theory development, which we call 'Bibliometric-Systematic Literature Review' (B-SLR). In doing so, we develop a 10-step process on how to apply the B-SLR. In each of the proposed steps, we discuss critical decisions and best practices to support researchers while crafting meaningful and theoretically relevant literature reviews. The B-SLR is intended as a flexible toolbox designed to accommodate diverse research objectives in the miner–prospector continuum, spanning from reviewing, theorising, tracing future roadmaps or creating bridges among different topics. The B-SLR incorporates the pillars of critical analysis, timeliness, coverage, rigour, coherence and originality of contribution, also emphasising the need for a novel and relevant theoretical contribution. The B-SLR is supported by a companion website, providing additional resources to assist researchers in this 10-step process: https://www.b-slr.org.

INTRODUCTION

Academic production is steadily growing in every field of science. A recent analysis of the Scopus database from 1900 to 2020 showed that the volume of academic publications increased by about 250% every decade (Thelwall & Sud, 2022). Thus, taking stock of the major inroads is becoming increasingly complex, making literature reviews a cornerstone for theory development by identifying critical gaps for further exploration and deepening the academic conversation (Alegre et al., 2023; Rousseau et al., 2008). In the effort to systematise such a growing corpus of knowledge, researchers have increasingly resorted to bibliometric methods, which offer the opportunity to analyse largely populated research domains by examining influential ties in terms of key contributions, prolific authors, on-topic journals and chronological evolutions (Zupic & Čater, 2015).

The natural complementarity between bibliometric analysis and systematic literature review (SLR) has induced researchers to combine these methods increasingly often. Despite such an increased use, those review studies rely on fragmented methodological suggestions without guiding frameworks. Against this backdrop, the present article proposes the following research question:

What are the methodological steps and key junctures for employing bibliometric analysis combined with a systematic literature review to deliver meaningful and relevant contributions which offer both a synthesis and a theoretical development?

To address this research question, our article proposes a pathway for multi-method reviews that aims to fill the discontinuity points among bibliometric approaches, SLRs and theory development. We name this process the 'Bibliometric-Systematic Literature Review' (B-SLR). The B-SLR is built upon established elements, such as (i) protocols such as the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021a) and A Measurement Tool to Assess Systematic Reviews 2 (AMSTAR 2) (Shea et al., 2017); (ii) tools such as VOSviewer (van Eck & Waltman, 2010); (iii) methodological reflections on bibliometric methods (Bascur et al., 2023; van Eck & Waltman, 2017; Zupic & Čater, 2015); (iv) practices for SLRs (Petticrew & Roberts, 2008; Simsek et al., 2021; Tranfield et al., 2003); and (v) theory development processes (Breslin & Gatrell, 2023; Post et al., 2020; Torraco, 2005, 2016).

The B-SLR originates in the context of management studies, where literature reviews span a 'miner–prospector' continuum (Breslin & Gatrell, 2023). Miners are characterised by a detailed examination of a specific research domain, aiming to outline and synthesise existing literature to position new contributions in relation to prior research. On the other hand, prospectors adopt a more expansive review strategy, potentially shifting from existing research paradigms (Breslin & Gatrell, 2023). In this view, the B-SLR is capable of contributing along this continuum. The B-SLR can help scholars to synthesise and explore existing knowledge paths by spotlighting gaps and interconnections and critically assessing prior literature. At the same time, by uncovering nested paths and missing conceptual links, the B-SLR enables researchers to expand the knowledge domain by leveraging new narratives, innovative methods and blended approaches.

In this perspective, the B-SLR can be intended as a flexible toolbox to enhance methodological rigour while stimulating author creativity, inviting scholars to move beyond the mere systematisation of prior research and offering new insights capable of expanding the scope of the academic debate. The B-SLR adheres to the 'UNESCO Recommendation on Open Science' (UNESCO, 2022) by using non-proprietary and open-source software and sources and proposing it as an open educational resource.

THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF B-SLR

'Review research' is an umbrella term for 'research inquiries that employ scientific methods to analyse and synthesise prior research to develop new knowledge for academia, practice and policy-making' (Kunisch et al., 2023; p. 5). Indeed, the analysis of scholarly publications constitutes an opportunity to spotlight research gaps, encourage the adoption of new theoretical lenses, stimulate the introduction of new theories and investigate under-explored areas (Alegre et al., 2023; Fan et al., 2022). Consistently, by discouraging 'researchers from using the same old theories and methods in a recycled and replete way' (Paul & Criado, 2020; p. 1), literature reviews are levers to trigger future research and new theoretical insights (Alegre et al., 2023; Breslin & Gatrell, 2023). Alegre et al. (2023) underscored that literature reviews should push the academic debate forward by identifying gaps, proposing new theoretical frameworks and exploring under-researched areas. In this vein, literature reviews should stimulate the academic community to move beyond conventional theories and methodologies. Indeed, *innovative conceptual contributions* often arise from integrating diverse theoretical and methodological perspectives. By drawing on theories from different domains, researchers can develop novel frameworks that offer fresh insights into familiar problems. As a result, impactful literature reviews should be able to challenge the status quo, generating curiosity among researchers and readers alike (Breslin & Gatrell, 2023).

Over the years, researchers have employed various review approaches, including narrative reviews, integrative reviews, SLRs and meta-analyses (Fan et al., 2022). Yet, with the sharp increase in academic production, bibliometric literature reviews acquired salience due to their role in mapping knowledge in a single, coherent corpus. However, a key challenge linked to pure bibliometric studies is to craft reviews that consistently deliver an innovative conceptual contribution to existing literature beyond describing established links and patterns. As such, we believe that bibliometric methods can offer a solid and rigorous base from which review authors can then apply their creativity and problematisation to move existing knowledge forward.

Bibliometric methods use bibliographic data from publication databases (e.g. Scopus and Web of Science [WoS])

and allow for visualising interconnections among contributions within and between research streams (Zupic & Čater, 2015). The bibliometric analysis spans five main methods: citation analysis, co-citation analysis, bibliographic coupling, co-author analysis and co-occurrence (co-word) analysis. Each provides distinctive insights to map the current state of knowledge by highlighting interconnections among contributions (Donthu et al., 2021).

However, 'bibliometric methods are not a substitute for but a *complement* to traditional methods of review' (Zupic & Čater, 2015, p. 436). Such methods provide a number of quantitative indicators related to a research stream (Donthu et al., 2021), focusing on the interconnections and centrality of the studies within a broader network. SLRs, instead, involve a qualitative analysis of academic documents to build a consistent picture of a specific body of knowledge by emphasising discrepancies, inconsistencies, and knowledge gaps to develop new theoretical frameworks to analyse phenomena (Breslin & Gatrell, 2023). At the intersection of bibliometric analysis and SLRs, the B-SLR combines quantitative and qualitative approaches to analyse literature, relying on metrics of interconnections among contributions, meeting the replicability and transparency tenets that distinguish SLRs, ultimately creating room for theorisation.

By using the B-SLR, researchers can benefit from the combined advantages of bibliometric analyses and SLR while limiting the intrinsic weaknesses of adopting such methods independently. To respond to the need for methodological guidance, the B-SLR integrates multiple literature review methods, supporting the preparation of both meaningful and relevant literature reviews. This enhances the purpose-method fit (Kunisch et al., 2023) by offering an integrated process favouring methodological cohesiveness among research project elements.

GUIDELINES FOR BIBLIOMETRIC-SYSTEMATIC LITERATURE REVIEWS (B-SLRS)

Following a multi-method approach, the B-SLR grounds on rigorous bibliometric analysis but then guides the transition from bibliometrics to SLR and prospective theorising. The B-SLR is supported by a companion website at https://www.b-slr.org to further help researchers adhere to the proposed guidelines. Consistently with UNESCO's Recommendation on Open Science (UNESCO, 2022), these sources are non-proprietary and open source.

We acknowledge that researchers have been provided with different software to perform bibliometric analyses, such as Bibliometrix (Aria & Cuccurullo, 2017), CitNetExplorer (van Eck & Waltman, 2014), CiteSpace (Chen, 2006), VisualBib (Dattolo & Corbatto, 2019) and VOSviewer (van Eck & Waltman, 2010), to name a few. In these guidelines, we selected VOSviewer as it is user-friendly, freely available, has extensive documentation and numerous online tutorials and receives constant updates from its developers. VOSviewer is available at https://www.vosviewer.com/.[1] However, the B-SLR could be adapted to the use of alternative software.

In Figure 1, we present a representation of the B-SLR workflow.

Furthermore, in Table 1, we provide an overview of the designed activities, outcomes, methodological pillars and sample references facilitating the understanding and implementation of each step. Table 1 also summarises methodological checkpoints, ensuring adherence to the B-SLR and offering a point of reflection at critical junctures. Such methodological checkpoints are intended to allow researchers to reassess and refine their processes iteratively. By looping back to earlier stages if initial results are not sufficiently insightful, researchers can re-evaluate the methodological choices, outcomes and conclusions, potentially uncovering overlooked patterns or refining theoretical frameworks. This iterative process enhances the depth and breadth of the analysis, leading to more thorough results and new insights that might not have been immediately evident.

Before entering the review process, we envisage that the B-SLR could benefit from the recruitment of a panel of experts, including academics and practitioners with expertise and interest in the field of study, which could assist researchers in fostering triangulation of the process via regular meetings during the process (Tranfield et al., 2003). The panel could be instrumental in triangulating critical decisions and assessments in specific stages. In the next subsections, we discuss in detail each of the 10 steps composing the B-SLR and three methodological checkpoints.

First step: research question and boundaries of the study

The first step concerns informal literature scanning, a series of tasks to gain further familiarity with the area under scrutiny (Cronin & George, 2020; Page et al., 2021a). This step is key as it defines the potential theoretical contribution of the study overall.

[1] VOSviewer is developed by van Eck and Waltman from the Centre for Science and Technology Studies (CWTS) at Leiden University in the Netherlands. Note that VOSviewer may require Java Environment to run, which is freely available at https://www.java.com/.

TABLE 1 Overview of the Bibliometric-Systematic Literature Review (B-SLR).

Step	Activities	Outcomes	Methodological pillars	Sample references
1: Research question and boundaries of the study	a. Informal literature scanning b. Identification of a research gap c. Definition and refinement of the research question d. Definition of inclusion/exclusion criteria	I. Topic choice II. Research question III. Inclusion/Exclusion criteria	Alegre et al. (2023), Colquitt and George (2011), Kunisch et al. (2023), Page et al. (2021a), Shea et al. (2017)	Balzano (2022), Kohtamäki et al. (2022), Laaser and Bolton (2022), Wagenschwanz (2022)
2: Search query definition	a. Identification of keywords b. Validation of keywords c. Development of the search string	I. Search string	Kuhrmann et al. (2017), Williams et al. (2021)	Caputo et al. (2021), Fan et al. (2021), Kohtamäki et al. (2022), Thomas and Tee (2022)
3: Database selection	a. Test of the string b. Choice of database(s)	I. Selected database for data extraction	Hiebl (2023), Mongeon and Paul-Hus (2016), Singh et al. (2021)	Caputo et al. (2021), Fan et al. (2021), Kumar Hota et al. (2022)
4: Data screening and data cross-checks	a. Data screening (e.g. duplicates, ineligible documents) b. Setting quality standards and limiting document type c. Cross-validation of data extraction	I. Raw dataset	Hiebl (2023), Page et al. (2021a)	Balzano (2022), Franco-Santos and Otley (2018), Rabetino et al. (2021)
5: Data cleaning and export	a. Creation of a document pool based on inclusion/exclusion criteria b. Database export	I. Refined dataset	Krippendorff (2019), Kuhrmann et al. (2017), Marzi et al. (2024), Mukherjee et al. (2022), Page et al. (2021a), Shea et al. (2017)	Linnenluecke (2016), Marzi et al. (2021), Thomas and Tee (2022), Turzo et al. (2022)
Methodological checkpoint 1 – data consolidation 1. Topic choice and definition of the research question as a foundational guide for the study 2. Definition of inclusion and exclusion criteria, setting the conceptual perimeter 3. Creation of an effective search string 4. Selection of primary and secondary databases to source pertinent documents 5. Acquisition of a raw dataset and refinement, creating a final dataset for grounding the subsequent steps **Information to be reported on the methodological section of the study developed with B-SLR**: 1. Literature perimeter 2. Inclusion and exclusion criteria 3. Research string 4. Database adopted as primary source and database used for cross-checking 5. Document type limitations: language, type of documents, etc. 6. The time span covered by the research query 7. Number of documents extracted from the first research query before the manual selection following the inclusion/exclusion criteria 8. The number of documents retained after the manual selection following the inclusion and exclusion criteria				
6: Bibliometric approach	a. Bibliometric approach choice (e.g. co-citation analysis, bibliographic coupling) b. Preliminary bibliometric analysis	I. Preliminary bibliometric results	Donthu et al. (2021), Mukherjee et al. (2022), van Eck and Waltman (2010), Zupic and Čater (2015)	Daniel et al. (2022), Marzi et al. (2021), Maseda et al. (2022), Rabetino et al. (2021), Wagenschwanz (2022)

(Continues)

TABLE 1 (Continued)

Step	Activities	Outcomes	Methodological pillars	Sample references
7: Clusters' topic identification	a. Refining key parameters for bibliometric analysis b. Clusters' identification c. Graphical analysis of bibliometric insights	I. Clustering II. Graphical representation	Bascur et al. (2023), McAllister et al. (2022), Simsek et al. (2021)	Balzano (2022), Daniel et al. (2022), Fan et al. (2021), Pellegrini et al. (2020)
8: Sample ordering and selection	a. Computing CBIS or the computation of normalised citations b. Ordering documents c. Sample selection	I. Dataset ordered by the representativity of the documents per each cluster II. Sample reduction (if needed)	Bornmann (2014), Krippendorff (2019), Marzi et al. (2024), Pech and Delgado (2021)	Kuhrmann et al. (2017), Lowry et al. (2013), Turzo et al. (2022)
Methodological checkpoint 2 – preliminary results assessment 1. Joint examination of initial bibliometric results 2. Critical assessment of the achieved standards of quality, impact and meaningfulness 3. Triangulation to ensure proper interpretation of the insights and document selection **Information to be reported on the methodological section of the study developed with B-SLR**: 1. Adopted version of VOSviewer 2. Aggregation criteria used in VOSviewer (e.g. bibliographic coupling, co-citations) 3. Resolution and minimum cluster size set inside VOSviewer 4. Criteria used for sample ordering and selection				
9: Systematic literature review	a. Holistic analysis of the dataset b. Specific clusters' thematic analysis	I. Results of the holistic analysis II. Results of clusters' thematic analysis	Klarin (2024), Petticrew and Roberts (2008), Post et al. (2020), Schmiedel et al. (2018), Simsek et al. (2021), Sinkovics (2016), Tranfield et al. (2003)	Fan et al. (2021), Kohtamäki et al. (2022), Marzi et al. (2021), Pellegrini et al. (2020), Rabetino et al. (2021), Schad et al. (2016)
10: Developing a theoretical contribution	a. Choice of the type(s) of synthesis for theorising b. Crafting a theoretical contribution	I. Research agenda *and/or* II. Taxonomy *and/or* III. Conceptual framework *and/or* IV. Metatheory	Breslin and Gatrell (2023), Gruner and Minunno (2024), Ketokivi et al. (2017), Post et al. (2020), Rousseau et al. (2008), Simsek et al. (2022), Torraco (2005, 2016)	Busch (2024), Laaser and Bolton (2022), Maclean et al. (2021), Pellegrini et al. (2020), Rabetino et al. (2021), Thomas and Tee (2022), Wagenschwanz (2022)
Methodological checkpoint 3 – contribution assessment 1. Joint examination of results of the SLR per cluster 2. Joint examination of the theorising outcomes 3. Assessment of impact and overall contribution as reflexivity and sense-making exercise 4. Minor refinements, checks and abstract writing **Information to be reported on the methodological section of the study developed with B-SLR**: 1. Guiding principles for the SLR 2. Procedures underpinning the SLR 3. Type(s) of synthesis used for theorising				
To support researchers with the B-SLR, we provide a guiding template for crafting methodological sections, available at https://www.b-slr.org/resources-for-authors/b-slr-methodological-template				

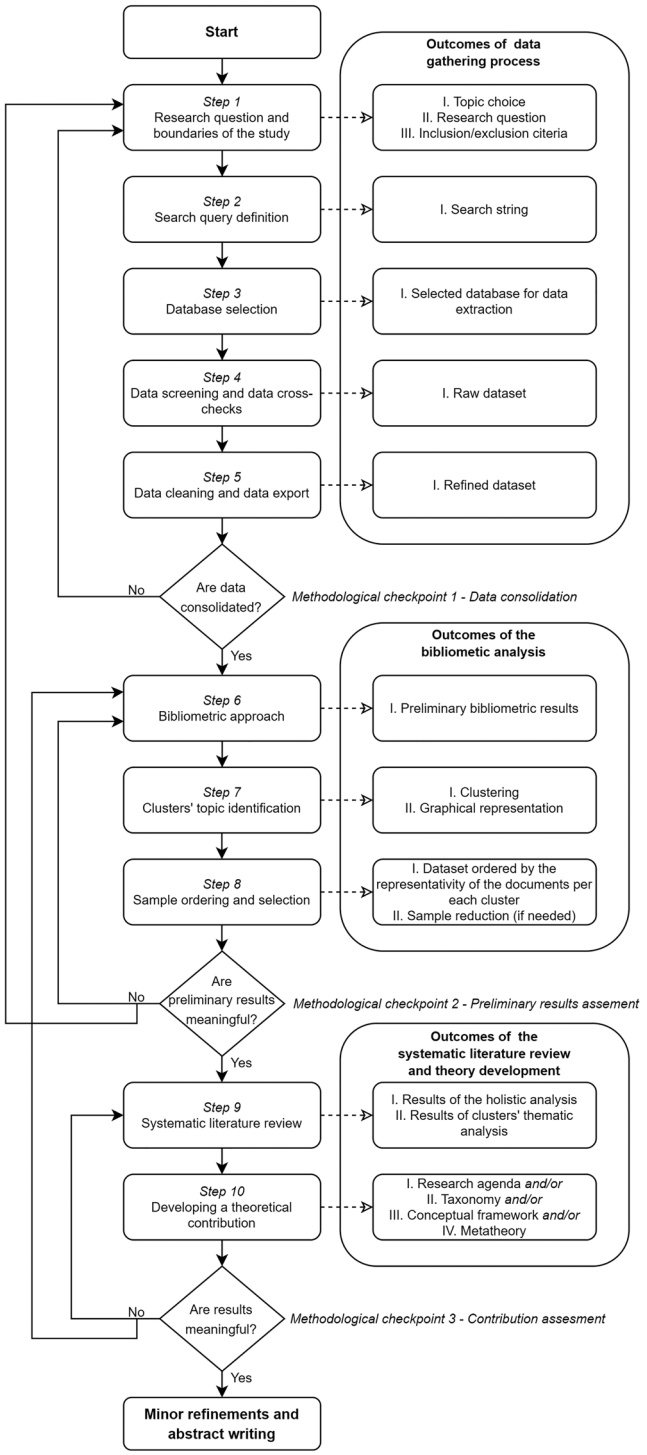

FIGURE 1 Workflow of the Bibliometric-Systematic Literature Review (B-SLR).

First, the researchers start by performing an initial literature scan, functional to identify a research gap, subsequently refined in a specific research question (Page et al., 2021a; Shea et al., 2017). Second, researchers define inclusion and exclusion criteria for the documents to be included in the review, which are intended to be the primary corpus of knowledge of the study (Page et al., 2021a). During the literature scanning, researchers should also ascertain the existence of previous reviews and the room for a novel contribution (Fan et al., 2022).

The topic choice and subsequent research question could be a challenging process that should aim at ensuring a valuable contribution to a field. Although benefiting from methodological rigour (Kunisch et al., 2023), review studies should have the purpose of delivering an innovative conceptual contribution to the literature (Alegre et al., 2023). The purpose of the review influences the research question (and the subsequent methodological choices) that should reflect the characteristics of significance, novelty, curiosity, scope and actionability (Colquitt & George, 2011). In assessing the significance of a research topic, researchers are called to contribute to the discourse around grand challenges, reflecting on issues of broad concern within a field or to society at large (Colquitt & George, 2011). It is key that the chosen question has the potential to advance the current understanding in a meaningful way, perhaps by addressing unsolved problems or by offering innovative solutions to known issues (Alvesson & Sandberg, 2020).

Novelty pertains to the need to introduce a fresh perspective or a new framework for tackling an unsolved issue. The research question should thus challenge existing paradigms or propose unexplored angles on a familiar topic, thus contributing to the evolution of the scholarly conversation within a discipline. This entails moving beyond mere incremental contributions and pushing the boundaries of knowledge ahead. Curiosity means that the research should spark interest and generate room for further inquiry, challenging common knowledge and existing paradigms. The scope of the research question should be tailored around a good balance between ambition and feasibility. The scope should be broad enough to encompass significant aspects of the topic but be focused enough to allow for thorough and coherent analysis. Actionability emphasises the practical implications of the research. For review studies, it implies bringing theoretical development, paving the way for further developments in policy, practice and academic conversation (Alegre et al., 2023).

From this perspective, a starting point could consist of reading the most cited documents on the topic and recent available reviews. From those documents, researchers are invited to undertake backwards and forward procedures to familiarise themselves with the literature and possibly identify relevant research gaps. Backward procedures refer to consulting the cited references from such documents, whereas forward procedures look at sources that have cited the document. At this stage, bibliometric tools could support the iterative process of definition, clarification and refinement through a preliminary overview of the

topic's structure (e.g. authors, journals, keywords and articles).

Following the AMSTAR 2 protocol (Shea et al., 2017), inclusion/exclusion criteria should rely on punctual concepts and definitions around the topic perimeter to minimise the room for selection bias and be set before moving to the next steps. Research questions and inclusion/exclusion criteria should be reported in the review (e.g. in the supplementary material or appendix), agreed upon among the researchers, and possibly triangulated with the experts' panel (Shea et al., 2017).

Second step: search string definition

In Step 2, researchers develop a search query – a specific combination of words (i.e. keywords) that are entered into a database (e.g. Scopus and WoS) to retrieve relevant documents (e.g. articles, book chapters, conference proceedings and editorials). During this phase, researchers should avoid using a narrow search query that could lead to the involuntary exclusion of relevant documents (Kuhrmann et al., 2017; Williams et al., 2021). For this reason, appropriate search queries should be wide-spanning in nature, allowing researchers to refine search outcomes further in the next phases through manual selection processes (Kuhrmann et al., 2017; Williams et al., 2021).

To this end, researchers could decompose the research questions into individual concepts to create search terms. Examining terminology used in prior literature could be functional in refining the search string. It is often useful to consider alternative terms and concepts that might address the same or similar question, as it is common for various terms to describe the same or similar phenomenon or research domain. Thus, researchers should also consider name variations among languages (organization vs. organisation), punctuations (small and medium enterprises vs. small- and medium-sized enterprises), abbreviations (new product development vs. NPD), synonyms (firm vs. company vs. enterprise vs. venture), plurals (firm vs. firms), derivations (entrepreneur vs. entrepreneurship vs. entrepreneurial; serendipity vs. serendipitous), broader and narrowed research terms around the research perimeter (human resource management vs. recruitment and selection vs. candidate interviews). To mitigate the risk of falling into these pitfalls, the search query should be built on the result of multiple iterative searches following snowballing techniques and/or a trial-and-error approach, informal conversations among researchers and/or feedback from experts in the field (Kuhrmann et al., 2017). Wildcards (*, ? and $) could aid researchers with name variations. Involving experts' panels, for example, by engaging them in a Delphi study to validate the keywords and initial results, could support the creation of a triangulated search string. Structured strategies from different fields (not always suitable for social sciences) include the PICO, PICOS and SPIDER search strategies (see Methley et al., 2014).

Specific cases related to search queries follow: If the intended B-SLR encompasses an update of an existing literature review, the search query should take into account the query already developed by prior research (e.g. Caputo et al., 2018; Turzo et al., 2022), building on (and possibly extending) previously developed queries with updated terminology; if the intended B-SLR aims to bridge existing topics, search queries could adopt the AND/OR Boolean operators to develop a string that allows different topics to be merged (e.g. Caputo et al., 2018; Fakhar-Manesh et al., 2021).

Third step: database selection

In the third step, researchers select the database and test their search strings. Different databases are available for query extraction (e.g. ABI/Inform, Business Source Ultimate EBSCO, Dimension, Scopus, Google Scholar, PubMed and WoS). VOSviewer supports data import from Dimension, PubMed, Scopus and WoS.

Scopus and WoS are typically adopted within management studies (e.g., Hiebl, 2023; Mongeon & Paul-Hus, 2016). Both databases offer extensive bibliographic data and research material, yet they differ in technical aspects, such as coverage, indexing criteria, data extraction capabilities and functionalities. Scopus, powered by Elsevier, provides broad coverage in terms of the number of journals, conference proceedings and books. It includes a wider array of disciplines, with a strong emphasis on science, technology, engineering and medicine fields, as well as social sciences and arts and humanities. WoS, powered by Clarivate Analytics, is known for its selective indexing criteria, focusing on high-impact journals, emphasising quality over quantity (e.g. WoS 'Core Collection').

We acknowledge the ongoing debate on academic databases' coverage in terms of the following dimensions: publishers, publishing outlets, time span and data quality (Mongeon & Paul-Hus, 2016; Singh et al., 2021; Zhu & Liu, 2020). Indeed, despite such divergences within the broad field of social sciences, it appears that both databases are a valuable basis for robust data extractions, even if sometimes they can lead to minor issues regarding 'online first articles' and citation counts (Franceschini et al., 2016).

Overall, we recorded an extensive use of both databases. As a result, if the researchers have access to both sources, the choice of the primary database for the analysis could be assessed by a pilot extraction on both sources, testing

along the aforementioned dimensions to determine which database offers the greatest coverage. If the sample extraction shows that relevant research is sparse across Scopus and WoS, researchers could consider merging data, taking into account possible inconsistencies in citation counts. To this end, different approaches are available (e.g. Caputo & Kargina, 2022; Kumpulainen & Seppänen, 2022).

Non-subscription-based alternatives to Scopus and WoS are Dimensions and PubMed. Dimensions offers extensive coverage across all fields of science, whereas PubMed is more focused on medical studies, rendering it less suitable for management studies (Singh et al., 2021). Although the use of Dimensions in management research is still limited, its extensive coverage and expanding functionalities could make it an appropriate choice as either a primary or an alternative database (Singh et al., 2021). Yet, although it is key to rely on a primary database for data extraction, the alternative database could be adopted as a secondary database to cross-validate the final data extraction (Page et al., 2021a) as we elaborate on the ensuing step.

Fourth step: data screening and data cross-checks

In the fourth step, researchers screen the documents to be included in the dataset. The screening phase involves the identification of the documents from the adopted database resulting from the search string developed during the third step (Page et al., 2021a, 2021b). The screening phase consists of the removal of duplicates and ineligible documents. In doing so, researchers can consider additional boundaries such as time coverage, document type, quality of the sources and language.

Regarding the time coverage, literature reviews could focus on different time spans. However, they usually involve at least 3–5 years, depending on the nature of the topic and quantity of published contributions (Hiebl, 2023). If researchers intend to update an existing review, we suggest including in the analysis (at least) the last year covered by the previously published review (e.g. Turzo et al., 2022).

Regarding the document type, while in specific fields such as computer science, conference proceedings constitute key ties in ongoing academic conversations, for reviews in management studies, conference proceedings are typically excluded, together with book chapters, books, editorials, commentaries, industry reports and notes. Thus, the data extraction could be limited to published articles, articles in press and review articles (Hiebl, 2023). For example, Kumar Hota et al. (2022) reported: 'We selected articles published in English [. . .]. Moreover, we only considered journal articles because they are "certified knowledge", having passed through a peer-based review process, thus ensuring reliability' (p. 6, Kumar Hota et al., 2022). It is worth noting that sources such as books and book chapters may contain relevant insights for the sake of the study; however, their inclusion in the dataset is limited due to data availability constraints from the databases. The language also plays a role in the availability of data for review. English-written contributions, achieving a wider academic audience, are the most frequent unit of analysis of reviews (Kumar Hota et al., 2022).

In terms of source quality, because Scopus and WoS (and Dimension) have a wide coverage of indexed journals, they sometimes index lower-ranked or newly established journals (Hiebl, 2023; Mongeon & Paul-Hus, 2016). Thus, researchers could refine the extraction output by incorporating the ISSNs retrieved from one of the widely adopted quality rankings of academic journals in the search string. In the management field, widely spread ranking lists include CABS, VHB, ABCD, and FT 50, among others (e.g. Busch, 2024; Rabetino et al., 2021). For example, various studies limit their search to journals included in the CABS list (e.g. Balzano, 2022), whereas others limit the pool to journals exhibiting at least two (e.g. Turzo et al., 2022) or at least three in the CABS list (e.g. Rabetino et al., 2021). Researchers could also focus on specific pertinent journals (Hielb, 2023) or use quartiles from Scimago, Scopus or WoS as a proxy for the quality of the selected journals. An alternative option, particularly beneficial for newly established research domains or those without well-established journal ranking lists, is relying on the Scimago Quartiles (https://www.scimagojr.com/). For example, researchers might include journals in the first quartile (Q1) or extend the selection to lower quartiles if relevant literature is sparse.

The decision about restricting to certain ranked sources should be carefully considered and be made based on the research design and characteristics of the investigated literature. For instance, literature reviews on emerging or niche topics would lose significant sources if limited by journal rankings, as most knowledge may be found in newer or less established outlets. Conversely, for established or mainstream topics, restricting reviews to high-ranking journals can help researchers identify the most impactful studies (Hiebl, 2023).

When researchers run the query in the Scopus database, they could use the operator 'TITLE-ABS-KEY', which carries out full-text searches on titles, abstracts and authors' keywords. The 'ISSN' operator allows for limiting the search to specific journals based on their ISSN. 'TS = ' and 'IS = ' are the equivalents in WoS.

To cross-validate the reliability of data extraction, we advise researchers to double-check included and

excluded documents by performing the same search query across multiple databases (Page et al., 2021a). Finally, the extracted dataset should contain documents from the entire solar years; otherwise, an explanation should be provided.

Fifth step: data cleaning and export

In the fifth step, researchers focus on data cleaning and export procedures. As suggested in the second step, formulating a broad search query could lead to retrieving non-strictly related documents for review. Thus, researchers should only select documents aligned with their research question, considering the set inclusion/exclusion criteria (Page et al., 2021a; Shea et al., 2017).

As a result, each of the documents extracted from the search query described in step four should be subject to accurate manual screening for inclusion assessments (Page et al., 2021a). In particular, based on the inclusion/exclusion criteria, researchers should assess which document to retain in the analysis or drop from the sample, applying critical judgment as per the AMSTAR 2 protocol (Shea et al., 2017). Such a stage improves the focus and reliability of the analysis, minimising the room for the inclusion of unnecessary documents.

The scanning is typically done by reading titles, abstracts or full documents, assessing the level of alignment between each of the documents and the boundary conditions of the review (Shea et al., 2017). This scanning could start by first looking at titles and abstracts and at the full documents in a second instance. A technique for a structured and transparent examination of the content fit of initially identified research items is the 'A/B/C logic' suggested by Pittaway et al. (2004). According to this logic, each research item is classified as either A (particularly relevant items), B (potentially relevant items) or C (items with little or no relevance). 'B' documents are separately treated once all documents are categorised, allocating them either to set 'A' or 'C' after a discussion among the authors. Only the A-rated research items are typically included in the final review sample.

Researchers are encouraged to visually represent their search and selection process using a flow diagram, as illustrated by Page et al. (2021b, p. 19). This visualisation should report the number of records retrieved, screened and included/excluded from the review. We advise researchers to include information (even as supplementary material or appendix) about the exclusion of seemingly eligible studies and the rationale thereof.

If multiple researchers work on a B-SLR study, we suggest that this phase is independently carried out by at least two of them, aiming at triangulating selection choices (e.g. Thomas & Tee, 2022). When discrepancies among researchers emerge, a discussion should follow to reach an agreement, reducing inter-observer inconsistencies and possible deviations from the inclusion/exclusion criteria (e.g. Krippendorff, 2019). Convergence assessments can be performed recurring to the computation of Krippendorff's Alpha coefficient (Krippendorff, 2019), for example, using the K-Alpha Calculator (Marzi et al., 2024) available at https://www.k-alpha.org/. When a single researcher conducts a B-SLR study, we suggest applying a similar process with the support of at least one expert in the field (e.g. Balzano, 2022) or engaging the aforementioned panel of experts.

The cleaning process concludes with the export in the '.csv' format (from Scopus) or in the '.txt' format (from WoS) of the cleaned database. For enhancing transparency and reproducibility, the complete list of the first retrieved documents could be disclosed as supplementary material or appendix attached to the publication, together with the cleaned database emerging from this step (e.g. Turzo et al., 2022).

Methodological checkpoint 1 – data consolidation

This consolidation process aims to ensure the rigour of performed steps while preparing the ground for the next steps. At this point, based on the accumulated knowledge retrieved by performing the first five steps of B-SLR, researchers should carefully check the clarity of the research question, the appropriateness of the outlined inclusion/exclusion decisions, the search string's effectiveness and the completeness of the gathered data. Should there be questions regarding the efficacy or appropriateness of any stage executed thus far, it is recommended that researchers reappraise critical stages or recalibrate the entire process from the beginning. Researchers may unveil new insights or nuances by re-performing some of the first steps that can significantly improve both the rigour and the relevance of the performed review.

Sixth step: bibliometric approach

In the sixth step, researchers initiate their bibliometric analysis. Bibliometric analyses may be categorised into two distinct yet interrelated components: bibliometric indicators and science mapping. Bibliometric indicators encapsulate a range of variables, including documents, authors, keywords, geographical scopes, time frames and other descriptive attributes pertinent to the dataset under scrutiny. Such indicators provide an

overview of key trends and parameters characterising a research stream (see Donthu et al., 2021) and should be examined to inspect sample characteristics (Mukherjee et al., 2022).

Instead, science mapping highlights the interconnections among documents, authors, publication outlets and keywords (Zupic & Čater, 2015). Science mapping analysis can easily be carried out through VOSviewer (van Eck & Waltman, 2010, 2017). When launching the VOSviewer software, researchers can choose among several clustering algorithms; among them, co-citation analysis and bibliographic coupling are the main co-occurrence techniques. The first embeds a historical perspective, whereas the second emphasises recent developments in a research stream (Zupic & Čater, 2015). Overall, co-occurrence analysis displays the commonalities among documents, authors' themes or journal conversations by leveraging how paired units are co-occurring. The underlying assumption lies in the positive association between the citation of the items and content relatedness (Bascur et al., 2023; van Eck & Waltman, 2010, 2017). Time is a core dimension of co-occurrence analysis: Co-citation analysis offers a picture of the field of study in the past; bibliographic coupling measures the degree of similarity between two items by computing the number of shared references between the two (Zupic & Čater, 2015).

Co-citation analysis can be appropriate when the B-SLR focuses on developing an evolutionary picture of the field. In contrast, bibliographic coupling is generally suggested for limited time spans (5–10 years) and exploration of less-established fields (Zupic & Čater, 2015). Researchers can also perform both analyses and compare the two outcomes (Ayoko et al., 2022; Caputo et al., 2021). In a third instance, authors could even rely on keyword co-occurrence, especially if the topic under study is still in its infancy or highly fragmented (e.g. Fakhar-Manesh et al., 2021).

All documents extracted from step five are included in the analysis with VOSviewer. Sometimes, VOSviewer reports that some documents are not connected either in terms of co-citations or bibliographic coupling. In these cases, we suggest not considering them in the bibliometric analysis, whereas such items should be manually integrated and connected to one of the formed clusters or a cluster of residuals. In this phase, we suggest not editing the default parameters that VOSviewer proposes in terms of resolution and minimum cluster size, which we will discuss in the next step.

Seventh step: clusters' topic identification

In the seventh step, researchers identify the main research topics through an iterative process based on an in-depth reading of the documents for each cluster (Simsek et al., 2021; Tranfield et al., 2003).

Upon examining the map generated with VOSviewer, each researcher should independently explore the content of each cluster by reading at least the abstracts of the included documents. If the cluster size is manageable, examining the full text of its documents is preferable. In this view, the advantage of VOSviewer analysis lies in identifying intersections and interconnections among documents and cluster overlapping. These relationships are displayable in three different ways: network, density and overlay visualisations (van Eck & Waltman, 2010). A schematic representation is provided in Table 2.

When researchers have crafted a general idea of the topics covered by each cluster, they should label the emerging clusters. Next, they confront each other to discuss the assigned labels. VOSviewer allows for setting a minimum cluster size inside the 'Analysis' panel. Although there is no fixed value for the cluster size to be set, we suggest a minimum threshold of 10% of the total size of the document sample. This parameter could vary if researchers reach an agreement on the added value of increasing or decreasing it to enhance the clarity and granularity of the analysis.

At the same time, researchers should consider the resolution parameter inside VOSviewer, which is set by default to the value of 1.00. Increasing the resolution generates additional clusters (while decreasing reduces them), providing a more granular display of the similarities among documents in terms of shared references (bibliographic coupling) or citations (co-citation analysis). Researchers can adjust (increase or decrease) the resolution parameter until they reach a satisfactory level of homogeneity inside each cluster. Such homogeneity should be grounded on the theoretical perspective inside the cluster or a distinguishing element of inquiry (e.g. a set of practices, an empirical context or various units of analysis). In Table 3, we propose four strategies to identify clusters and unfold topics within and between clusters.

In this view, researchers are invited to collaborate on topic identification and validation to reflect a consensus understanding of the field's thematic structure. Researchers are also invited to document the process of adjusting the resolution parameter to provide a rationale for the chosen settings, improving the reproducibility of the analysis and providing a clear justification for the analytical decisions made during the clusters' topic identification process.

At the end of the seventh step, researchers should export the 'map' file in '.txt' format from VOSviewer using the 'save' function. Then, the map file is imported into spreadsheet software (e.g. LibreOffice, Microsoft Excel, Google Spreadsheet), setting the ground for the next steps.

TABLE 2 Types of analysis available in VOSviewer.

Type of visualisation	Description	Scope
Network	Enables scrutinising the spatial distributions of the documents and their respective clusters to figure out the overarching knowledge structure within a field	Highlights the relatedness and interconnection among topics and clusters, offering insights on documents' centrality within a research stream
Density	Underscores the magnitude and influence of specific subdomains in a given research field It employs different colour gradients, wherein a blue tone indicates areas of diminished impact, a green tone indicates an average value, and a yellow shade denotes regions of greater intensity and activity	Highlights the extent to which the knowledge base in a field is either homogeneous or fragmented. It assists in identifying chief documents recurring across various clusters and/or topics
Overlay	Displays the temporal evolution of a field Elements and regions depicted in blue tones indicate well-established topics, moving to green to indicate developed topics, whereas those progressing to yellow tones denote emerging trends	Highlights the progressive developments occurring over a specified time span, helping identify topics that have garnered increased interest in recent years and future trends

Eighth step: sample ordering and selection

The eighth step links the bibliometric analysis with the subsequent review process. It allows for ordering and selecting the documents within each identified cluster. The ordering and selection procedure helps researchers in establishing which order and (in case the researchers opt not to include all the documents) which subsample of documents to systematise in the ensuing steps.

Ordering and selecting a subsample of documents is a delicate task, where researchers should evaluate multiple criteria and balance between a number of metrics and their subjective assessments (e.g. Page et al., 2021a). To this end, in the B-SLR we introduce a quantitative assessment in support of the researchers' evaluation pertaining to the representativity of documents within the identified sample. Although the selection and review of the final sample are mostly contingent upon the researchers' field-specific knowledge, which is crucial for each type of review (Tranfield et al., 2003), data-informed suggestions could assist in the assessment and, if required, facilitate the selection of a subsample of documents for the inclusion in the SLR.

In management studies, an informal survey of the leading review journals (e.g. IJMR, JoM, AoM Annals, Research Policy, JMS) over the last 10 years identified an average number of documents reviewed approximately equal to 100, with a standard deviation of ±40. This evidence-based insight should be handled by being aware that the average length of a journal article usually varies from 8000 to 12000 words. In this guideline, we suggest considering the inclusion of all the documents identified from the previous steps when the total sample spans inside the range of 100 ± 40, recalling that review depth is inversely proportional to the total number of included documents.

In contrast, when researchers opt for selecting a representative subsample of documents, we suggest using two alternative ordering criteria: normalised citations (NCs) or a composite indicator that we call the 'composite bibliometric influence score' (CBIS). Both approaches can be easily performed through spreadsheet software using the 'map' file generated with VOSviewer, as presented in the previous step.

Regarding NCs, this metric constitutes an indicator of the contribution's impact in those samples where time spans considerably vary (Bornmann, 2014). NCs account for the differing citation practices and publication years across various documents, allowing for comparisons regardless of the publication time. Although citations are a direct indicator of a document's influence, the raw citation counts can be misleading as they favour older articles. Normalisation adjusts citation count considering the average citation rate adjusted for the document's publication time and the sample's characteristics, allowing for a time-adjusted comparison among documents.

However, relying on a single metric may not fully capture the multifaceted influence of the documents within the sample, and comparative approaches relying on multiple indicators may be beneficial. Here, we propose that researchers could rely on CBIS, which is grounded on a combination of three key parameters computed by VOSviewer: NCs, total links (TLs), and TL strength (TLS). TL refers to the count of connections among entities in a network. Within the context of the B-SLR, the document network refers to the aggregate number of connections that a given document has with other documents in the

TABLE 3 Strategies for Clusters' topic identification.

Type of strategy	Description	Scope
Iterative resolution adjustment	Iterative resolution adjustment could be a dynamic solution that incrementally modifies the resolution parameter in VOSviewer. Researchers can observe the impact on cluster compositions by starting with the default setting (1.00) and making gradual adjustments (either increasing or decreasing) This process allows for granular data exploration, facilitating the identification of broad and narrowly defined topics. The iterative nature of this strategy ensures that researchers can fine-tune the clustering to capture the most meaningful and coherent groupings of documents based on shared references, citations or thematic content It is particularly useful for uncovering subtle connections between documents and ensuring that the clusters accurately reflect the underlying scholarly discourse	*Network visualisation*: Iterative adjustment of the resolution parameter can alter the network topology, revealing or vanishing connections between documents and clusters. This visualisation helps assess how the strength and number of linkages between documents change with resolution adjustments, offering insights into a research field's core and peripheral areas *Density visualisation*: Through iterative adjustments, researchers can observe changes in the concentration of research activity within specific areas. Density visualisation showcases these changes in thematic intensity, helping to identify areas of high scholarly concentration or emerging research frontiers as the resolution parameter changes. *Overlay visualisation*: This visualisation can track how iterative adjustments affect the temporal distribution of research topics. Changes in resolution might reveal new trends or show how established areas evolve, highlighting the dynamic nature of research fields over time
Comparative cluster analysis	Comparative cluster analysis involves generating and analysing bibliometric maps at multiple resolution settings to examine the stability and variability of topics across different levels of granularity. This strategy enables researchers to distinguish between core and peripheral topics within the research landscape Core topics should remain consistent across various resolution settings, indicating their robustness and centrality to the field. On the other hand, peripheral or emerging topics may appear or disappear as the resolution changes, highlighting their potentially peripheral role Comparative cluster analysis is valuable for assessing the reliability of identified themes and understanding how different analysis levels can reveal varying aspects of the research domain. It helps identify which themes are foundational to the field and which are more speculative or nascent	*Network visualisation*: Comparative cluster analysis across different resolutions enables researchers to see which topics or clusters remain stable and which fluctuate. Network visualisations can illustrate the robustness of connections and the centrality of clusters across varying resolutions, highlighting the pillars and peripheral documents within the research domain *Density visualisation*: By comparing density maps generated at different resolutions, researchers can identify consistent areas of high research activity and thematic density. This helps in understanding which themes are persistently significant across different levels of granularity *Overlay visualisation*: Comparative cluster analysis with overlay maps can highlight how the prominence of research topics shifts over time at different resolutions. This aids in pinpointing both core and peripheral research trends
Thematic homogeneity assessment	This aims to achieve a balance between the breadth (coverage) and depth (focus) of clusters to ensure each represents a coherent and thematically homogeneous set of documents By adjusting the resolution parameter, researchers seek to refine clusters to accurately reflect a unified theoretical perspective, empirical context or set of practices. This strategy is key for ensuring that clusters are not overly broad, which could vanish meaningful distinctions between documents, nor too narrow, which might fragment closely related research unnecessarily The thematic homogeneity assessment is functional in identifying clusters where the included documents share substantial common ground, facilitating deeper insights into specific research areas. Thematic homogeneity is a key in the interpretability of bibliometric analyses, as it ensures that the clusters are meaningful and relevant to researchers' specific purposes and questions	*Network visualisation*: This strategy benefits from network visualisation by allowing researchers to ensure that clusters display a high degree of thematic coherence. The spatial arrangement of nodes (representing documents or terms) can indicate the thematic similarity within clusters, aiding in the adjustment process for optimal homogeneity *Density visualisation*: Thematic homogeneity is visually supported by density maps, where a consistent thematic focus results in clusters with uniform colour intensity, indicating a concentrated research effort in specific areas of the map *Overlay visualisation*: Overlay visualisation can help assess the temporal consistency of thematic homogeneity within clusters, showing how themes have developed over time and ensuring that the clusters reflect coherent research trajectories

(Continues)

TABLE 3 (Continued)

Type of strategy	Description	Scope
Benchmarking against known literature	Benchmarking involves adjusting the clustering resolution to ensure that seminal works and well-established research findings have been appropriately grouped within the analysis This strategy uses landmark studies or key documents as reference points to validate the clustering process. By ensuring that these significant works are correctly positioned within relevant clusters, researchers can verify that the cluster formation aligns with established knowledge structures within the field Benchmarking could also serve as a quality control measure, confirming that the bibliometric analysis accurately reflects the intellectual landscape of the discipline. It provides a mechanism for validating the analytical approach against the backdrop of existing research, ensuring that the identified clusters are both accurate and meaningful within the broader scholarly context	*Network visualisation*: The benchmarking strategy uses network visualisation to ensure that seminal works and key documents are centrally located within appropriate clusters, reflecting their foundational role in the field. This helps validate the network's stability based on established knowledge *Density visualisation*: By benchmarking against known literature, researchers can use density visualisation to verify that key documents contribute significantly to the thematic density of their clusters, serving as focal points of intense scholarly activity *Overlay visualisation*: This visualisation aids in benchmarking by highlighting the temporal positioning of seminal works, ensuring that they align with the field's historical development. It confirms that pivotal studies are properly situated within the timeline of emerging and evolving research trends

sample. For example, in a citation network, a link is formed between two documents when one cites the other. The total count of such links for a document reflects its engagement with the rest of the literature considered in the sample. Thus, a higher number of links suggests a more prominent role of the document. TLS extends the concept of TLs by considering the intensity of these connections, providing a more detailed insight into their influence.

The procedure to combine the previous indicators into the CBIS involves three sequential stages. First, each of these parameters is subject to a min–max scaling, which rescales the data to a common range, thereby facilitating comparability (a 1–10 scale is suggested to prevent zero-nullifying effects). In this perspective, we recall that scaled values can be obtained with the following formula:

$$Scaled\ x = \frac{(x - x_{\min})}{(x_{\max} - x_{\min})} \times (range_{\max} - range_{\min}) + range_{\min} \quad (1)$$

Such a scaling procedure is applied for each of the three metrics. For example, for NC, the formula takes the following form:

$$Scaled\ NCx_n = \frac{(NCx_n - NC_{\min})}{(NC_{\max} - NC_{\min})} \times (10 - 1) + 1 \quad (2)$$

Second, the CBIS of each document is then computed using a multiplicative approach, where the product of the adjusted metrics reflects a consolidated measure of impact and relevance (Equation 3):

$$CBIS\ x_n = Scaled\ NCx_n \times Scaled\ TLx_n \times Scaled\ TLSx_n \quad (3)$$

Third, CBIS is used for the ordering of the documents within each cluster.

When researchers have completed the ordering procedure with NCs or CBIS, a sampling technique may be employed to facilitate the selection of a subsample of documents while ensuring that each cluster is proportionally represented. Researchers should set percentile values for each cluster in a number not below 10% of the total number of documents within each cluster (Bornmann, 2014; Turzo et al., 2022). Considering the range of 100 ± 40 (pertaining to the whole sample), the needed granularity that researchers would give to their review of the literature, and the proportional representation of each cluster (Pech & Delgado, 2021), researchers can adjust the percentiles to different threshold values, for example 0.90, 0.75 and 0.50.

As the B-SLR only seeks to provide guidance, we remind that researchers bear the ultimate responsibility to decide the granularity, length and overall narration of their reviews. Thus, after obtaining the order and sample selection for each cluster, researchers are invited to qualitatively re-assess the appropriateness of the process by re-reading at least the abstracts of the excluded documents, together with the full text of the documents included. Researchers could independently check whether that exclusion is not impairing the overall quality of the review and assess their evaluations via agreement coefficients such as Krippendorff's Alpha (Marzi et al., 2024). If the value is below the recommended threshold of 0.80, disagreement among the researchers about the excluded documents should be treated through informal discussion, if necessary, reintegrating previously excluded documents. As we envisaged

before, a panel of experts could support the validation of the selection process.

At the end of the eighth step, researchers should have obtained a list of ordered documents following the criteria they selected to guide the final steps of the B-SLR. If subsampling procedures have been carried out, researchers are provided with a list of representative documents proportionally reflecting each cluster.

Methodological checkpoint 2 – preliminary result assessment

At this stage, researchers should jointly re-examine the initial bibliometric results, critically assessing their quality, impact and meaningfulness. A triangulation among co-authors (possibly complemented by the panel of experts) is suggested to favour the interpretability of the gained insights as well as the observed patterns and interconnections. This checkpoint enables researchers to critically evaluate their results, thereby enhancing the depth of their reflections necessary for the subsequent theoretical contribution in an exercise of reflexivity and sense-making.

If results do not exhibit satisfactory standards of quality, impact and meaningfulness, or if new discoveries are made by investigating the results obtained that would have changed some of the premises or assumptions used, it is recommended that the bibliometric analysis is revisited or iterated. This might entail reassessing the suitability of chosen aggregation criteria (e.g. from bibliographic coupling to co-citation analysis) or adopting alternative approaches (e.g. keywords analysis). If such an iterative process does not yield satisfactory outcomes, researchers should critically reflect on the sense-making of the entire process anew, questioning the study's contribution. Ultimately, it is suggested to reassess the purpose of the review and the research question, either broadening or narrowing its scope, re-evaluating the inclusion/exclusion criteria and perhaps adopting alternative theoretical lenses to prepare the ground for a new analysis.

Ninth step: systematic literature review

The ninth step involves SLR-based activities (Petticrew & Roberts, 2008; Simsek et al., 2021; Tranfield et al., 2003), including two types of complementary analysis: one holistic and one cluster-specific. The former aims at identifying cluster interconnections and overarching theoretical frameworks. The latter delves into tracing the systematisation of the knowledge emerging from each cluster. Those two approaches are instrumental for a theoretical contribution as researchers have both the opportunity for a wide-angle view of the literature and a deeper look at each substream.

SLR aims to synthesise and critically evaluate the existing body of knowledge by employing a qualitative thematic analysis approach to identify, analyse and interpret relevant themes and central concepts within the literature (Petticrew & Roberts, 2008). SLR embeds core information on what we currently know, that is thematic analysis, and grounds the basis for what we currently do not know (and need to know) (Post et al., 2020). Thus, in support of SLR, utilising the VOSviewer for analysis enables researchers to access a spatial representation of the literature (van Eck & Waltman, 2010). The bibliometric indicators (Mukherjee et al., 2022) can support crafting the main lines of interpretation of the literature as a whole (e.g. keyword frequency, highly cited documents, prolific authors and prominent journals). This representation facilitates knowledge understanding and integration supported by the presented visual cues.

As far as the holistic analysis is concerned, science mapping via the various types of visualisations offered by VOSviewer (as we detailed in Table 2) can be leveraged to unpack the causal links among items. The network visualisation highlights the relatedness and intersectionality among topics and clusters, offering reflections on the documents' centrality within a research domain. The closeness or overlap between clusters necessitates in-depth scrutiny and reflection on documents' interconnections, with the aim to extend beyond the boundaries of a cluster to foster knowledge integration and identification of emerging perspectives (Klarin, 2024). The density visualisation helps researchers determine the homogeneity or fragmentation of the knowledge base, by identifying key literature foundations across clusters and topics, highlighting core axes of scholarly discourse in the field (Klarin, 2024). The overlay visualisation enhances researchers' awareness regarding the progressive developments occurring over a specified time span. In addition, it helps identify topics that have garnered increased interest in recent times, thereby potentially indicating areas rich with promising future research endeavours (Fakhar-Manesh et al., 2021).

The holistic analysis needs to be integrated with a cluster-specific analysis, that is reviewing the content of each cluster. The analysis framework by Petticrew and Roberts (2008) is adopted and coupled with the holistic analysis. Four sequential activities are proposed: (i) the organization of the studies into subcategories, (ii) the analysis of the findings for each subcategory, (iii) the analysis of findings across subcategories and (iv) the analysis of findings across clusters.

The organization of the studies into subcategories begins with the tabulation of documents by cluster, focusing on distilling elements such as the research questions,

theoretical lens, contexts, key findings, methodological approaches and measures and key implications. The tabulation process should be informed and guided by the ordering activities that characterised Step 8 (based on NCs or CBIS), prioritising what the researcher had identified as prominent documents. This tabulation provides a concise overview, presenting key information in columns and a list of documents in rows. Such a table could be integrated into the study, in the main text, appendix or supplementary material. Indeed, organising studies allows for an in-depth exploration of 'themes across studies, as well as facilitating theory-testing by exploring similarities and differences between study findings' (Petticrew & Roberts, 2008, p. 172). Studies can be grouped according to the various dimensions, hence facilitating the emergence of latent relationships and differences between the study findings and higher order themes. The analysis of each subcategory involves a narrative description and synthesis, where the researcher interprets and summarises the findings of each study within its subcategory. The narrative synthesis aims to articulate how each study contributes to the overarching understanding of the subject matter and the particular characteristics of each cluster as emerged from Step 7. To this end, researchers report patterns, consistencies and discrepancies among the findings of the studies grouped together. Such an analysis seeks to report the underlying mechanisms and contextual factors that may explain the observed outcomes at a subcategory level. In analysing findings across subcategories and clusters, gained insights are integrated to construct a more comprehensive understanding within and between the clusters. This involves comparing and contrasting the findings across the different cross-cluster subcategories, aiming to trace the co-influence lines in the literature. Accordingly, setting links among clusters is functional for developing a theoretical framework or model that encapsulates the insights derived from the SLR.

For the activities of (i) organization of the studies into subcategories, (ii) analysis of findings across subcategories and (iii) clusters, the VOSviewer map could offer another layer of analysis, displaying additional and nested information (Klarin, 2024; McAllister et al., 2022). For example, we suggest analysing the focal points of the VOSviewer map. Focusing on a particular item, that is a document, can highlight how it is embedded in the network, both in terms of the number of connections and strength. Instead, the overlay visualisation offers insights into the time evolution of items, showing how they are interconnected with older and newer items. For each document, both network and overlay visualisation analyses offer instrumental avenues for carrying out a thematic/critical analysis. When it would be challenging to analyse each item, we suggest using the ordering obtained from Step 8.

Other approaches to identifying and categorising document patterns could rely on content analysis (Sinkovics, 2016) or topic modelling (Schmiedel et al., 2018). For example, Thomas and Tee (2022) reviewed the literature on the construct of generativity by leveraging axial coding procedures (Corbin & Strauss, 2015). This allows the authors to move beyond categorising antecedents and outcomes, instead introducing a conceptual framework on how and where generativity influences innovation in organizations. Similarly, Schad et al. (2016) applied structured content analysis to explore antecedent–process–outcome relationships among core constructs in paradox studies involving four stages: sampling, coding, analysis and interpretation. These approaches allow for the identification of key theoretical themes nested inside the clusters and literature inductively.

Tenth step: developing a theoretical contribution

The 10th step of the B-SLR concerns a theoretical synthesis and thematic interpretation of the emerging results. It is indeed of utmost importance to recall that effective literature reviews should 'go beyond the kind of contributions that synthesize, organize or map the field' (Alegre et al., 2023, p. 233). Considering the necessity to increase theoretical depth, here researchers are invited to challenge assumptions, develop novel constructs and/or integrate diverse theoretical perspectives. To do so, they can adopt diagrams, frameworks or models to visually represent the theoretical advancements proposed. Visual tools can support the analysis of the relationships and the logical flow of the article, making theoretical contributions clearer and more impactful by engaging with recent studies.

Drawing from Torraco (2016), a literature review should include multiple intertwined outcomes: a thematic/critical analysis to undertake a sense-making process of the current debate, accompanied by a synthesis and a theorisation effort to develop the field towards future directions further. From this angle, the theoretical contribution of review studies involves navigating the miner–prospector continuum (Alegre et al., 2023), which embeds elements of author creativity and ranges from consolidating existing knowledge to pioneering exploration of novel ideas and interdisciplinary ventures (Breslin & Gatrell, 2023). For the miner approach, this integration process involves identifying research gaps within the existing body of literature, systematically organising and categorising literature to clarify the current state of knowledge, problematising the literature to highlight areas needing further exploration and identifying as well as exposing mixed findings within the literature (Alvesson & Sandberg, 2020). The

prospector approach is characterised by efforts to transfer theories across domains, develop analogies and metaphors that bridge these domains and blend and merge pieces of literature from different fields to foster interdisciplinary insights. Additionally, prospectors aim to set out new narratives and conceptualisations, thus introducing groundbreaking perspectives that challenge and extend beyond existing paradigms.

To effectively navigate the miner–prospector continuum, researchers should clearly articulate the positioning of their review. This involves identifying whether their work aims to deepen understanding within a specific domain, introduce novel perspectives and challenge existing paradigms (Gruner & Minunno, 2024). In this view, developing a theoretical contribution in a review study involves a process of knowledge weaving, which encompasses several stages to synthesise existing literature into original contributions (Gruner & Minunno, 2024; Simsek et al., 2022).

As Simsek et al. (2022) suggested, researchers should start by re-evaluating the knowledge claims within their chosen research domain. This stage sets the direction for the theory development process by identifying critical claims pertaining to phenomena of interest or the state of theoretical knowledge. Using the B-SLR, researchers may leverage the findings from the ninth step, which pertains to their specific research questions, thus spotlighting key assumptions, stylised facts, enduring critiques and substantive omissions within the literature. Next, researchers assess the developmental status of the domain together with the presence of underexplored boundary conditions or mixed findings. After that, researchers prospect for alignment by generating a list of potential avenues for theory development, attempting to see 'what everybody has seen and thinking what nobody has thought' (Simsek et al., 2022, p. 1347), unveiling insights that might not be self-evident when reading documents or clusters in isolation. This involves innovatively framing the existing knowledge claims, considering the potential for contributing with new insights or challenging established assumptions. Then, researchers evaluate the value of their theoretical development, considering the theorisation's ability to advance an academic debate, the relevance to both backward-looking and forward-looking knowledge claims, and the potential to address grand societal challenges. The final stage involves prototyping the theoretical contribution for an audience, ensuring their relevance and appeal to academic and non-academic stakeholders (Kunisch et al., 2023).

The B-SLR suits multiple avenues for advancing theorising, including 'exposing emerging perspectives, analysing assumptions, clarifying constructs, establishing boundary conditions, testing new theory, theorising with systems theory, and theorising with mechanisms' (Post et al., 2020, p. 351). Talking about specific strategies to pursue these avenues, multiple syntheses are available for the B-SLR, taking the form of a research agenda, a taxonomy or a structured interpretative framework, the development of alternative theoretical models or emergent interpretative framework and metatheory (Torraco, 2016). In Table 4, we summarise the contribution of the B-SLR to the theorising, bridging the type of synthesis by Torraco (2016) with the associated theorisation avenues proposed by Post et al. (2020), and the specific application in the B-SLR context. For enhanced clarity, for each type of synthesis, we also define its conceptual perimeter and underlying rationale in using it, then briefly discuss its theoretical value.

In undertaking theorising with B-SLRs, we want to stress the specific value added by this multi-method framework in the several types of synthesis. Questions in research agendas are functional to consolidate existing knowledge structures and/or expand the theoretical development of present aggregates. Particularly for emerging fields or subjects experiencing paradigmatic shifts, the results of the thematic/critical analysis could drive the creation of research questions pertaining to an entire research domain. These questions may also be suggested by scrutinising overlay visualisation in VOSviewer by observing the interconnections among clusters and/or the distance among the clusters in the network visualisation. Research agendas can be framed around exploitative and explorative research questions (e.g. Pellegrini et al., 2020). Exploitative research questions address mature topics that still necessitate further inquiry, thus in a more miner-like approach (Alegre et al., 2023; Breslin & Gatrell, 2023): for example scrutinising assumptions, clarifying concepts, setting boundaries and developing new theoretical insights based on existing patterns. Explorative research questions, instead, refer to promising research directions that have received limited attention and could be useful for figuring out new perspectives, new assumptions and emerging trends, thus in a more prospector-like approach (Alegre et al., 2023; Breslin & Gatrell, 2023). Thus, such research agendas could assume the form of a two-by-two matrix, balancing research questions in terms of nature (explorative vs. exploitative) and pertinence (holistic vs. specific). To enrich the breadth of research agendas, outcomes from other synthesis types can be integrated.

Regarding taxonomies or structured interpretative frameworks, we report multiple theorisation avenues. For example, they could align the SLR results (Step 9) with previous frameworks, categorisations or theories pertinent to the discipline, better adhering to the miner approach (Breslin & Gatrell, 2023). This approach is adequate when the B-SLR aims to analyse assumptions, clarify constructs or schematise emerging patterns via a structured framework. Furthermore, researchers can

TABLE 4 Type of synthesis for theorising in Bibliometric-Systematic Literature Review (B-SLR) articles.

Type of synthesis	Conceptual perimeter	Underlying rationale	B-SLR application	Possible theorisation avenues	Theoretical value
Research agenda	A research agenda is based on a set of research questions that can inform the future development of the field	To systematically identify gaps and set a structured pathway for advancing the field, ensuring continuous development and innovation in research	Research agendas could present questions that pertain to the results of thematic/critical analyses performed at the cluster level (cluster-focused questions) or that pertain to the holistic analysis (general questions)	– Proposing further emerging perspectives – Challenging literature assumptions by proposing different ones or relaxing the existing ones Summarising areas need for further clarification where future research should set its locus of attention – Leading more investigation on existing and new boundary conditions and ways to further examine them – Directing future efforts in exploring how new theory testing could contribute to a field – Looking at a phenomenon at large, exploring trajectories, transformational conditions or subcomponents of the broader phenomenon	Establishes a detailed roadmap for future research by highlighting critical gaps, emerging areas and critical questions to move the field forward. Research agendas should be capable of influencing future studies and encouraging the exploration of novel theoretical landscapes or fine-graining more studied avenues
Taxonomy (structured interpretative framework)	A taxonomy is an organised synthesis that classifies the thematic/critical analysis results to set the ground for future developments	To create a coherent understanding of the field that aids researchers in navigating and synthesising theoretical constructs, promoting clarity and depth in scholarly discourse	A taxonomy or structured interpretative framework should incorporate the overarching themes or clusters identified through the review, juxtaposing them against established or emerging frameworks, key elements and theories within the discipline or even those borrowed from other fields	– Illustrating the key differences among salient theoretical constructs by contrasting old and new theoretical perspectives – Comparing and clarifying the underlying assumptions and showcasing the core dimensions leading to their variations – Classifying boundary conditions, mechanisms and core concepts – Testing the validity of a new or existing theory	Provides a comprehensive and systematic classification that clarifies and organises the key concepts, theories, variables and frameworks in the field. This structured synthesis facilitates a deeper understanding of theoretical constructs and their interrelations, enabling scholars to identify core dimensions, boundary conditions and underlying assumptions

(Continues)

TABLE 4 (Continued)

Type of synthesis	Conceptual perimeter	Underlying rationale	B-SLR application	Possible theorisation avenues	Theoretical value
Alternative model (emergent interpretative framework)	Alternative models are innovative ways to frame existing knowledge	To innovate and provide fresh perspectives on existing knowledge by addressing overlooked areas and reconceptualising established ideas	Alternative models can be derived directly from thematic analysis and assessing what prior literature did not extensively address. An alternative model or emergent interpretative framework should summarise the key elements of the holistic and specific thematic/critical analysis into new (or partially new) schemes and reassess their interconnections via theoretical synthesis	– Introducing and comparing different models' assumptions, constructs and boundary conditions – Contrasting established models with new ones – Investigating the explanatory power of a new model based on existing evidence – Framing the whole literature as a system composed of different elements – Illustrating how conflicting results may be explained by unidentified mechanisms that have not been previously discovered	An alternative model offers innovative perspectives that challenge and extend existing paradigms by introducing new elements, relationships and frameworks. This synthesis fosters intellectual advancement by providing alternative explanations and reconceptualising the interconnections within the body of knowledge. It addresses gaps and contradictions in the literature, proposing novel theoretical constructs and explanatory mechanisms, thereby enriching the theoretical landscape and guiding future inquiry
Metatheory	Metatheory refers to applying existing theories from different and eventually unrelated disciplines, for example, leveraging analogical reasoning	To broaden the applicability of theories and create innovative connections across different fields, fostering interdisciplinary research and expanding the scope of theoretical frameworks	A metatheory can support a prospector approach, facilitating the creation of new conceptual links among clusters or subtopics	– Expanding emerging perspectives to explain other phenomena in similar domains – Expanding boundary conditions across phenomena, contexts and disciplinary boundaries – Focusing on key underlying assumptions and conceptual ambiguities by reconciling sparse viewpoints – Showing how a new theory applies across prior research findings in different research domains	Enhances theoretical richness by integrating and transcending disciplinary boundaries, creating comprehensive frameworks that apply across various contexts and domains. This synthesis leverages analogical reasoning to establish connections between disparate fields, offering new conceptual linkages and broadening the applicability of existing theories. It fosters interdisciplinary innovation and addresses complex phenomena through a multifaceted theoretical lens, promoting greater conceptual depth and further theoretical advancements

compare the results of the SLR, borrowing existing theories and frameworks from other disciplines or creating their emergent categorisation, following the prospector approach (Breslin & Gatrell, 2023). This could, in turn, support theorising efforts in examining emerging perspectives, patterns and boundary conditions or inducting and mapping existing theories (Post et al., 2020). Focusing on a particular item of the network visualisation can offer suggestions to identify explored areas and gaps. In this view, overlay visualisation techniques can further suggest the emergence of new concepts and topics that can be integrated into the taxonomy.

Next, alternative models or emergent interpretative frameworks are innovative ways to frame existing knowledge (Torraco, 2005), adapting more to a prospector approach (Alegre et al., 2023). Such models can be initially informed by VOSviewer analysis, which highlights the documents or aggregated groups of documents in the same colour tone. In this way, the alternative model can showcase the belongingness of each element or relationship to one (or more) cluster. Similarly to the taxonomy, both single-item network and overlay visualisation could support researchers in identifying how a particular element is interconnected with others and their evolution over time, allowing them to interpret such interconnections as key pillars of an emergent framework (Post et al., 2020).

Another option for theorising in the context of the B-SLR is based on metatheory. In this context, metatheory enhances the theorisation of existing research within a particular field of study, definitely adopting a prospector approach (Alegre et al., 2023). Metatheories often emerge through analogical reasoning, seeking similarities among diverse phenomena occurring in even distant domains and identifying isomorphic relationships. Thus, identifying a metatheory usually does not arise from inquiry into the existing literature identified via the B-SLR; instead, it comes through a discovery process of exploring distant fields and re-applying theories in another context. Therefore, metatheory could be applied together with other syntheses – taxonomies, alternative models or research agendas – enriching their structures and contents.

Methodological checkpoint 3 – contribution assessment

At this stage, researchers should have carried out the B-SLR and should assess their overall contribution to the literature. Researchers have completed the SLR both at a holistic and specific level. The review offers an analysis of the data, capturing patterns, trends and findings specific to each cluster or the literature as a whole. B-SLR-based studies should offer a crafted picture of what we know on a topic while revealing key research gaps and offering new theoretical contributions, leveraging one or more types of synthesis for theorising.

The assessment of the impact and the overall contribution can be viewed as another exercise of reflexivity and sense-making of the study as a whole. Should results be below expectations, it is suggested to come back to Step 9 or eventually Step 6, re-performing the bibliometric analysis, re-reading documents and eventually undertaking a second round of pattern observation. A panel of experts can be consulted further to enhance the study's rigour and quality, gather feedback and round out the overall contribution.

EXPANDING B-SLRs

As it is designed, the B-SLR offers room for several methodological variations. One could be integrating computational approaches such as topic modelling (Antons et al., 2021). Deriving from computer science, topic modelling is based on adopting a series of algorithms to examine textual data and display representations of latent topics within a text (Schmiedel et al., 2018). Indeed, topic modelling is gathering the attention of management scholars as it facilitates the creation of underlying conceptual linkages, reshaping existing conceptual perimeters (Antons et al., 2021; Hannigan et al., 2019). We believe there are significant touchpoints between topic modelling and literature reviews based on keyword co-occurrence. In the B-SLR workflow, we envision that topic identification within and between clusters could be supported by topic modelling, thus allowing a more granular exploration of the core themes.

The B-SLR could also extend existing approaches for other review studies, such as integrative literature reviews and problematising reviews. Integrative literature reviews focus on the development of new conceptual insights that may not readily emerge within a single-research stream (Cronin & George, 2020). On the other hand, problematising literature reviews follow the principles of 'the ideal of reflexivity, reading more broadly but selectively, not accumulating but problematising, and the concept that "less is more"' (Alvesson & Sandberg, 2020, p. 1290). To this end, the B-SLR could be tailored to aid researchers in uncovering interconnections and nested pathways, for example, via VOSviewer clusters' topic identification strategies presented in Table 3.

The B-SLR can also be applied in the context of a review of reviews, also known as 'umbrella reviews', 'second-order/-level reviews' or 'meta-reviews'. This approach refers to a review that summarises and elaborates findings from multiple reviews (Sutton et al., 2019). In this context,

the B-SLR can be useful for exploring broader interconnections and evolutionary patterns in an aggregate manner. To this end, researchers can systematically analyse and integrate the vast array of data and conclusions drawn from various reviews. This comprehensive approach allows for identifying overarching trends, gaps, and space for theorisation, enhancing the understanding of complex and multidisciplinary topics.

Finally, the integration of artificial intelligence (AI) within the B-SLR represents a forward-looking direction aimed at enhancing the efficiency and automation of this approach. AI technologies offer promising solutions for managing and analysing large datasets, including supporting and automating data extraction and categorisation (Wagner et al., 2022). Additionally, AI can facilitate topic analysis and brainstorming ideas, uncovering novel insights and fostering integrative theories that bridge disciplinary boundaries. We acknowledge that the discourse surrounding the responsible use of AI in research has emerged as a critical concern for academic communities worldwide (Gatrell et al., 2024). It is worth noting that human ingenuity lies in the unique ability of researchers to ask profound questions, interpret phenomena in original ways and consider the broader implications of their studies. Therefore, the integration of AI into academic research should be viewed as a collaborative endeavour, where AI tools serve to enhance, rather than replace, the contributions of human researchers.

Overall, the B-SLR is conceived as a flexible toolbox for promoting systematic engagement with existing literature and yielding meaningful and relevant review contributions. Drawing on the proposed process, we encourage scholars to suggest variations more closely aligned with particular requirements or incorporate novel methodological tools, in line with the Open Science framework (UNESCO, 2022). Finally, although we do not see any specific impediment to adopting this process across various disciplines, we encourage scholars to tailor the B-SLR to accommodate the unique attributes of specific fields.

CONCLUSION

In the present study, we propose a 10-step process to support researchers in the B-SLR. By filling discontinuity points among bibliometric approaches, SLRs, and theory development, the B-SLR consolidates and guides researchers by joining the available tools and methodologies for the multitude of means of review studies. In developing the B-SLR, we attempted to adhere to the Recommendation of the Open Science Framework (UNESCO, 2022), valorising the use of accessible, non-proprietary and open resources and software. Still, B-SLRs are subject to limitations. Despite our efforts, we acknowledge that combining bibliometrics with SLR can lead to complex analyses and interpretations of the results, requiring vast expertise in bibliometric and SLR methods both in the writing of the manuscript and handling the peer review process. Although there are numerous advanced tools and methodologies available for conducting literature reviews, the core of a successful review still lies in a researcher's deep understanding and comprehensive analysis of the subject literature. In conclusion, as bibliometric analysis, SLRs and the need for theory development are gaining momentum, we encourage researchers to adopt and further develop, comment and extend the B-SLR.

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