“PLEASE, NEXT TIME YOU DEAL WITH INNOVATION, DO NOT CLOSE YOUR EYES TO NATIONAL CULTURE”: Theoretical-empirical gaps in the international literature

André Luiz Mendes Athayde; Sally Vivicananda Alves Salgado.

Abstract

This study quantitatively examines international scientific production at the intersection of national culture and innovation. Using a bibliometric approach, we searched multidisciplinary databases via the CAPES Journal Portal without temporal restrictions, applying title-based search strings and successive filters for thematic relevance, document type, duplication, access, and language, which resulted in a final sample of 73 articles. Results indicate a growing interest in the topic, predominance of quantitative and theoretical-empirical studies, concentration of field research in the private sector, and prevalent use of secondary data with descriptive statistics and regression techniques. The analyses reveal gaps: a scarcity of qualitative and multi-method studies, limited investigation in the public and third sectors, and fewer studies addressing individual-level innovation. We propose a research agenda to diversify methods, expand sectoral coverage, and deepen theoretical development linking cultural dimensions and innovation outcomes. The study contributes by mapping the field and highlighting opportunities for future research.

Keywords:

national culture; innovation; bibliometrics; scientific production; organizational development

1 Introduction

Innovation refers to transforming creative ideas or inventions into practical, useful, and valuable applications, products, or services. It goes beyond simple creativity, strategically applying knowledge and resources to generate something new or improved that impacts the market or society. This concept combines technology as an innovative product and its commercialization, making innovation one of the engines of a country's economic and social progress. Technological innovations such as artificial intelligence and renewable energy create new industries and reshape traditional sectors such as manufacturing, communication, and transportation (Tambosi Junior, Tambosi, & Falaster, 2021).

Hence, innovation is relevant for developing national economies, allowing them to quickly adapt to global changes, conquer new markets, and keep up with technological advances (Amidžić, Leković, Fazekaš, & Matić, 2022). Furthermore, the innovation process, which involves everything from the conception of an idea to its materialization as a marketable product or service (Johnson, 2022), promotes sustainable development, improves the efficiency of economic operations, and generates a significant impact on the internal economy, an impact that can be observed in the creation of high-skilled jobs, increased productivity, and increased market attractiveness for international investments (Lee, Chernikov, Nagy, & Degtereva, 2022).

The literature highlights the importance of innovation for economic and social development, being widely explored in individual, organizational, and macroeconomic contexts (Yao, Marescaux, Ma, & Storme, 2023; Pucheta-Martínez & Gallego-Álvarez, 2023; Lee et al., 2022; Ullah, Agyei-Boapeah, Kim, & Nasim, 2022; 2018; Schumpeter, 1934). However, analyses that discuss the possible influence of national culture on innovation do not occur at the same frequency (Athayde & Coutinho, 2023; Amidžić et al., 2022; Woodside, Megehee, Isaksson, & Fergunson, 2019; Perez-Penalver, Aznar-Mas, & Fleta, 2018).

Although innovation is relevant to economic and technological advancement, its adoption in countries, especially developing ones, presents unique challenges. Innovations from developed countries often carry the values and social context of their origin, raising questions about their compatibility with the cultural values of developing nations. Understanding the cultural context of innovations is essential for their successful adoption and integration, as these cultural differences can ensure that innovations drive desired positive outcomes by aligning with the norms and values of the place in which they will be introduced. Therefore, investing in understanding national cultures is fundamental to the innovation process, especially when considering its global diffusion and acceptance (Setiawan, 2020).

Theoretical-empirical evidence in the literature points out the influence of cultural differences between countries on individual values, attitudes, and behaviors (Borsatto, Bazani, & Amui, 2020; Athayde & Coutinho, 2023), as well as the possible influence of national cultures on

innovation at individual, organizational, and macroeconomic levels (Amidžić et al., 2022). Culture refers to the collective programming of the mind that distinguishes groups of people through their shared values, beliefs, and behaviors rooted in their national or regional identity (Hofstede, 2001). These cultural patterns passed down through generations influence how individuals perceive their surroundings, interact in their societies, and approach problem-solving and decision-making. These deeply ingrained behavioral norms significantly affect how societies engage with innovation and adapt to technological or social changes (Amidžić et al., 2022).

Our argument in this paper is not to demonstrate the importance and benefits of innovation, whether at the individual, organizational, or national level. There is no doubt about that, and the literature already demonstrates this relevance almost exhaustively. Our question and provocation, through this research, is: since innovation is such an important topic, and considering that strong theoretical and empirical evidence in the literature has demonstrated that national culture influences values, attitudes, and behaviors, has national culture been satisfactorily investigated in conjunction with innovation? Is this intersection already a mature field of research in the international literature, or is there still room for further exploration?

In this context, the primary objective of this study was to analyze, quantitatively, international scientific production that intersects the themes of national culture and innovation, aiming to map publication trends, such as the most adopted types of research, authors with the highest numbers of publications, the most recurrent thematic focuses, and the most prominent scientific journals, contributing to the advancement of knowledge on the topic. The literature presents bibliometric studies on national culture (e.g., López-Duarte, Vidal-Suárez, & González-Díaz, 2017) and innovation (e.g., Cui, Tang, Zhang, & Dai, 2023) separately, but bibliometric studies that combine the two themes are scarce, which constitutes a theoretical-empirical gap yet to be filled.

The analysis of indicators that represent scientific productivity ponders information concerning research activities. Bibliometric analysis consists of evaluating the dissemination of knowledge through scientific publications, which can prospectively indicate new paths for research lines. The assessment of knowledge production through bibliometric indicators is used, in part, to analyze the size, growth, and distribution of scientific bibliography as a way of improving scientific information and communication activities and, in parallel, to analyze the mechanisms of scientific research (Yoshida, 2010; Araújo, 2006).

We hope that the findings of this study will serve as a reference for future research that intersects the themes of national culture and innovation, inviting explanatory models of innovative values, attitudes, and behaviors not to forget cultural variables. Furthermore, we hope that future qualitative research address issues related to national culture when deeply investigating perspectives on innovation. Subsequently, as a theoretical review, we retrieve previous studies on national culture and innovation. Next, we present the methodological procedures adopted to achieve the study objective. Afterward, we present and discuss the results, followed by final remarks, suggesting a research agenda for ulterior investigations.

2 Theoretical review

Cross-cultural researchers such as Hofstede (2001) and Trompenaars and Hampden-Turner (1997) have developed cultural dimensions to analyze and quantify cultural differences between countries in a standardized and validated way. Hofstede proposed six cultural dimensions: Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long-Term Orientation, and Indulgence. Trompenaars and Hampden-Turner expanded these dimensions, introducing other dimensions such as Universalism and Time Orientation. These frameworks provide structured ways of understanding cultural diversity and its impact on social behaviors and interactions (Setiawan, 2020).

The Power Distance dimension addresses the unequal power distribution in a society, which reflects how less powerful people expect and accept this disparity. It allows us to compare the degree of inequality between different societies. The Individualism dimension, in turn, explores the interdependence that society maintains between its members and the definition of self-image in terms of "I" or "we". In individualistic societies, people are expected to look after themselves and their immediate family. In collectivist societies, individuals belong to internal groups in exchange for loyalty. The Masculinity dimension addresses motivation and cultural values related to the search for success and fulfillment. A high score on this dimension indicates a society driven by competition, achievement, victory, persistence, and success, with the latter defined by superior performance, that is, by meritocracy. On the other hand, a low score suggests an emphasis on caring for others, quality of life, and well-being as pillars of success (Hofstede Insights, 2025).

The Uncertainty Avoidance dimension analyzes how different societies deal with the uncertainty inherent to the future, investigating whether they seek to control or accept what is to come. This dimension reflects how much culture members feel threatened by ambiguous and uncertain situations and develop beliefs and institutions to avoid them. The Long-term Orientation dimension, in turn, explores how societies balance preserving established traditions and norms with adapting to present and future changes and challenges, prioritizing these goals differently. Societies with low scores tend to value time-established traditions and view social change with suspicion. Those with high scores take a more future-oriented approach, promoting innovation and progress. At last, the Indulgence dimension assesses the degree to which people try to control their desires and impulses, based on how they were raised. The relatively weak control is called Indulgence, typical of societies that value leisure and pleasure and that tend to be optimistic. Relatively strong control is called Restriction (Hofstede Insights, 2025).

Hofstede's aforementioned culture dimensions offer valuable insights into the interaction between culture and innovation. For example, societies with low Power Distance can promote more open communication and encourage creative contributions at all company levels, potentially accelerating innovation. Likewise, individualistic cultures may emphasize personal fulfillment and entrepreneurial activities, leading to higher innovation rates. On the other hand, cultures with high Uncertainty Avoidance may resist experimentation or unconventional ideas, slowing innovation processes due to the preference for stability and predictability (Setiawan, 2020; Athayde & Coutinho, 2023).

The cultural dimensions of Trompenaars and Hampden-Turner further enrich this analysis since universalist cultures, which emphasize general rules and structures, can excel in creating standardized technological solutions. Particularistic cultures can prioritize context-specific innovations adapted to local needs. Temporal orientation also plays a relevant role. Future-oriented cultures are more likely to invest in long-term innovation strategies, while past-oriented cultures may focus on preserving traditions and incremental improvements of preexisting resources (Setiawan, 2020).

Understanding cultural dimensions is relevant, especially in the globalized world where cross-cultural interactions are frequent in multinational companies and international markets. Misunderstandings concerning cultural disparities can hinder collaboration, disrupt communication, and impact organizational effectiveness. On the other hand, promoting cultural intelligence and exploring the unique characteristics provided by these dimensions can increase collaboration, trust, and innovation. Organizations that respect and accommodate cultural diversity are better positioned to develop strategies that promote harmony and effectiveness in global operations (Amidžić et al., 2022; Tambosi Junior, Tambosi, & Falaster, 2021).

A growing number of studies have investigated the possible influence of national cultures on individual, organizational, and macroeconomic innovation indices. As an example, Boubakri, Chkir, Saadi, and Zhu (2020) developed a study that analyzed the influence of national culture on innovation in the corporate environment, also known as organizational innovation. The results showed that companies are more likely to present innovative behaviors when established in regions with high Individualism, Masculinity, and Long-term Orientation, as well as in regions with low Uncertainty Avoidance and Power Distance.

Bennett and Nikolaev (2020), in turn, explored the relevance of the individualistic cultural characteristic for the innovative profile of a society based on a study carried out with data from 84 countries. The authors concluded that countries with a higher Individualism index are more likely to advance in the innovation sector, as Individualism is associated with greater proactivity, typical of innovative individuals (Corrêa, 2019). Tekic and Tekic (2021) also carried out research that showed that some cultures have characteristics that favor the innovative process. Weathley (2001), in turn, highlighted the following innovative characteristics: adaptation, creativity, and commitment.

Pucheta-Martinez and Gallego Álvarez (2023) used a sample of 37 countries to investigate the impact of national culture on companies' innovative profiles. Their results demonstrated that some characteristics of national culture can undermine innovation, such as high levels of Uncertainty Avoidance and Power Distance, which, according to Athayde and Coutinho (2019), inhibit the proposition of new ideas given the greater concentration of decision-making power and risk resistance respectively.

Espig, Mzzini, Zimmermann, and Carvalho (2021) analyzed data from the Global Innovation Index (GII) to investigate the association of cultural dimensions with country innovation. From this analysis, the authors concluded that national innovation indices are favored in countries with

low Power Distance and high levels of Individualism, Long-term Orientation, and Indulgence. According to Athayde and Coutinho (2019), high levels of Indulgence favor innovation since indulgent societies are comprised of individuals who tend to be optimistic, a typical characteristic of innovative individuals (Corrêa, 2019).

Kim et al. (2020) investigated the influence of national culture on innovative practices in emerging economies. The results highlighted the negative effect of the cultural dimension of Uncertainty Avoidance on innovation levels in the countries analyzed. Tambosi Junior, Tambosi, and Falaster (2021), in turn, investigated the effect of cultural dimensions on countries' innovative practices. The results showed that high levels in the Uncertainty Avoidance and Power Distance dimensions negatively impact the countries' innovation rates, unlike Masculinity and Individualism, whose characteristics favor the development of creative ideas.

Having retrieved some studies that intertwine the themes of national culture and innovation, the next section will detail the methodological procedures adopted to fulfill the objective of this research.

3 Methodological procedures

Regarding the objectives, the present study is a descriptive and exploratory research, which aims to describe and explore a phenomenon respectively (Gil, 2008), in this case, international scientific production on the intersections between national culture and innovation. Regarding the approach to the problem, a quantitative approach was adopted for data collection and analysis, using bibliometric analysis as a technical procedure, which consists of the study of the quantitative aspects of the dissemination of scientific production on a given topic (Athayde & Silva, 2019). According to Webster and Watson (2002), an effective literature review creates a solid foundation for knowledge advancement, facilitates theory development in areas where research already exists, and contributes to finding specific fields where research is needed.

Bibliometrics is an approach that uses indicators of the quantity and impact of scientific works and the extent of the cooperation network between researchers at a given level of specialization, with the primary objective of measuring the result of scientific production, clarifying its structure and helping in decision-making and research management, thus evaluating the current state of development of science on a given topic (Okubo, 1997). The bibliometrics adopted in this study focused on articles published in scientific journals. According to Gil (2008, p. 62), "journals constitute the most important means for scientific communication, making it possible to formally communicate original research results and maintain quality standards in scientific research".

In this study, data collection took place by surveying articles published in Brazilian and international scientific journals on national culture and innovation available on the Coordination for the Improvement of Higher Education Personnel (CAPES) Journal Portal. The CAPES Journal Portal has a collection of around 45 thousand journals and 130 reference bases. The choice of the CAPES Journal Portal as a search location for this bibliometrics was based on the fact that the innovation construct is interdisciplinary. Thus, the search on such a portal would

simultaneously cover a high number of databases in diverse knowledge areas. For instance, the CAPES Journal Portal includes the recognized databases Web of Science (WoS), Scopus, ScienceDirect, Directory of Open Access Journals (DOAJ), Scielo, Pepsic, and PubMed. The search for articles took place on July 1, 2024.

To proceed with the search, the Boolean logical operator "AND" was used, which aims to group different terms and expand the search, providing greater incisiveness in the results (Pizzani, Silva, Bello, & Hayashi, 2012). The English descriptors "national culture" and "innovation" were used and their respective Portuguese translations. The asterisk (*) was used so that the search could find words with similar spelling. Thus, the search strings were: "national cultur* AND innovat*" (English) and "cultur* nacional AND inova*" (Portuguese). The descriptors were searched in the titles of the articles, aiming to find manuscripts with a greater probability of a direct relationship with the thematic focus of bibliometrics. To obtain a robust representation of international scientific production on the intersections between national culture and innovation, no time frames were adopted, that is, no filters were applied regarding the year of publication of the articles.

After carrying out the initial search, using the strings in the title field, we identified 225 studies. These publications had their titles, abstracts, and keyword sections read to discard articles without thematic adherence. We first discarded 106 studies without a direct relationship with the intersections between national culture and innovation. Next, we excluded 17 studies not classified as articles, such as books, book chapters, teaching cases, dissertations, theses, and abstracts. Right after, we discarded 14 duplicate studies indexed in more than one database or published in more than one language. Finally, we excluded 11 unavailable studies (without open access) and four studies published in languages other than English and Portuguese (e.g., Japanese). The final number of articles eligible for analysis was 73. Table 1 summarizes the filters applied in this bibliometrics.

Table 1. Filters applied in the bibliometric analysis

Filters	Number
Studies resulting from the initial search	225
Excluded for lack of thematic relevance	106
Excluded for being non-articles	17
Excluded duplicates	14
Excluded due to lack of access	11
Exclusão outras línguas	4
Eligible Total	73

Source: Authors

The 73 articles that intertwined the themes of national culture and innovation had their titles, abstracts, keywords, and methodology sections read and classified according to 10 categories, namely: (1) authors and respective countries of origin, (2) year of publication, (3) scientific journals, (4) classifications of scientific journals according to the Qualis strata of the

Coordination for the Improvement of Higher Education Personnel (CAPES), Impact Factor (Journal Citation Reports – JCR), SCImago Journal Rank (SRJ), and H-index, (5) sector of the economy in which the research was carried out (first, second, or third sector), (6) study framework (theoretical or theoretical-empirical), (7) type of research regarding the approach to the problem (qualitative, quantitative, or multimethod), (8) data collection or extraction instrument, (9) data analysis technique, and (10) thematic focus.

We used the Iramuteq software to complement bibliometrics, supporting quantitative data analysis. According to Maracajá, Pereira, and Pinheiro (2021), the Iramuteq software can receive various textual information. In this case, the textual information was the corpus comprised of the titles of the 73 articles and the corpus formed by the keywords of such articles. We created word clouds to illustrate the most frequent words. Right after, we proceeded with a Similarity Analysis that allowed us to identify the strength of the connection between the words, ultimately validating the previous analyses.

4 Results and discussion

4.1 Authors of the articles

The 73 articles analyzed in this study were written by 175 different authors. Of these, only eight authors wrote more than one article (two articles each). This finding points to the low centrality of authors on the intersections between national culture and innovation. Table 2 summarizes the authors with more than one publication.

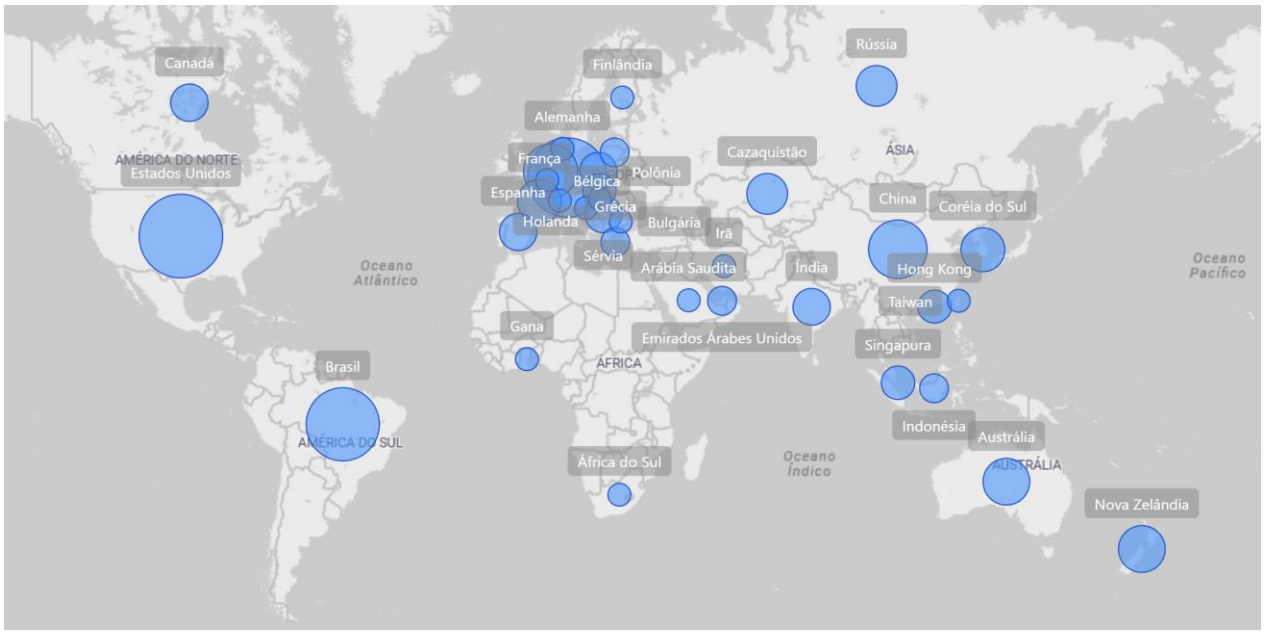
Table 2. Authors with more than one publication

Author	Institution of origin	Country	Number of articles published
Subhan Ullah	University of Nottingham	United Kingdom	02
Andreas Rauch	Leuphana University Lüneburg	Germany	02
Michael Frese	National University of Singapore	Singapore	02
Jens Unger	University of Gießen	Germany	02
Eric Waarts	Erasmus University Rotterdam	Netherlands	02
Yvonne Van Everdingen	Erasmus University Rotterdam	Netherlands	02
Tony Smale	Forté Management Consulting	New Zealand	02
Jandir Tambosi Junior	Universidade Regional de Blumenau	Brazil	02

Source. Research data

The authors of the 73 articles analyzed come from 36 different countries. Figure 1 illustrates the countries of origin of all 175 authors. Those countries marked in the illustration with larger blue bubbles are the countries of origin for the highest number of authors. Among these countries, the United States, England, and Brazil stood out as the countries with the highest number of authors who published on intersections between national culture and innovation, with 27, 24, and 20 respective authors.

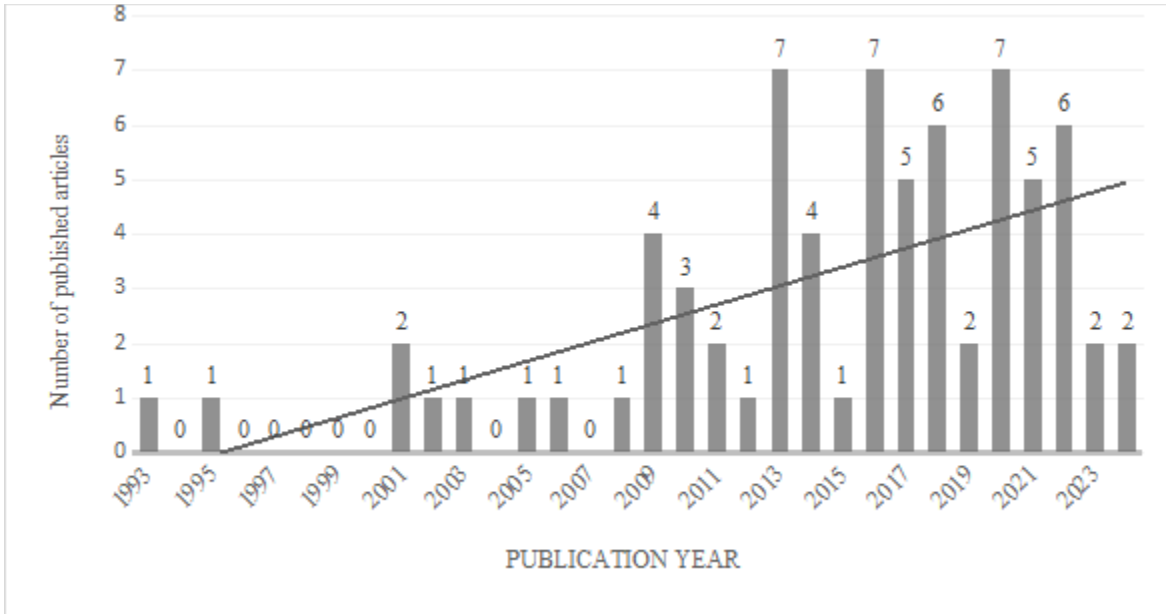
Figure 1. Country of origin of the authors



Source. Research data

4.2 Years when articles were published

Graph 1: Years when the 73 articles were published



Source. Research data

The oldest study identified in this bibliometrics was published by Shane (1993) in the Journal of Business Venturing and investigated the influence of national culture on national innovation indices in 33 countries. The research concluded that higher levels of innovation were associated

with low levels of Uncertainty Avoidance, low levels of Power Distance, and higher levels of Individualism. Such cultural dimensions were proposed by the Dutch psychologist Hofstede (1980) and are the most widely used in cross-cultural studies to characterize national cultures (Athayde & Coutinho, 2019).

Shane (1993) brought up the argument that, when it comes to innovation, national culture matters. The author presented the implications of his findings for managers and public policymakers. According to the author, countries may not be able to increase their innovation rates simply by increasing financial investments in research and development and industrial infrastructure. Thus, according to his argument, it is necessary to encourage changes in citizens' values to culturally encourage innovative activity. Innovation rates are influenced by more fundamental forces than economic conditions, and cultural changes in societies can be necessary to make them more innovative. The author proposes that Individualism can be relevant to innovation because it is associated with autonomy, independence, and freedom. Low levels of Uncertainty Avoidance and Power Distance can be relevant for innovation due to the role that change tolerance and power distribution play in the innovation process.

4.3 Journals where articles were published

The 73 articles analyzed were published in 65 scientific journals in 19 countries. The American journals "Technological Forecasting & Social Change" and "Journal of Business Venturing" presented the highest number of publications, with three articles each, followed by four journals, with two publications each. The other journals presented only one published article each. Such results suggest that no scientific journals worldwide can be considered references concerning the intersection of national culture and innovation themes. Brazil presented four journals with one publication each on the topic, namely, "Innovation & Management Review (Revista de Administração e Inovação)", "Revista Brasileira de Comunicação Organizacional e Relations Públicas", "Revista Gestão Organizacional", and "Estudos CEPE". Table 3 presents impact data for scientific journals with the highest number of publications on the topic.

Table 3. Journals with the highest number of publications on the topic

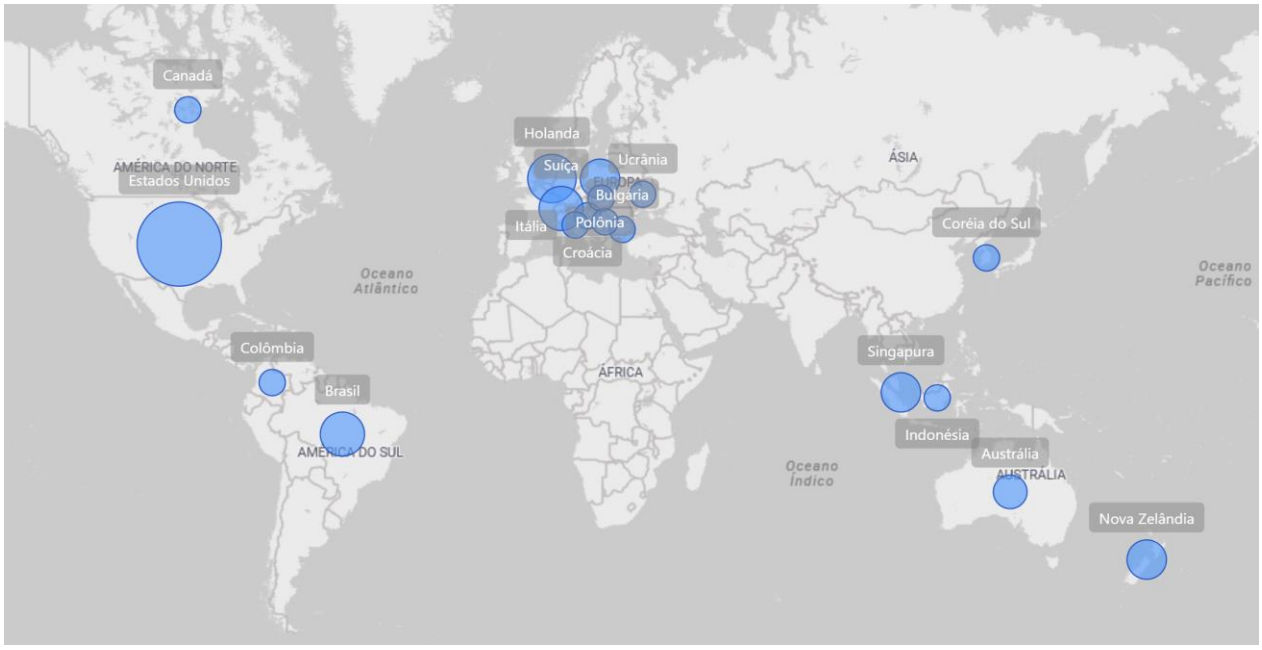
Journal	Number of published articles	Country	CAPES Qualis (2017-2022)	Impact Factor (JCR-2023)	H-Index	SJR (2023)
Technological Forecasting & Social Change	3	United States	A1	12.9	179	3.12 (Q1)
Journal of Business Venturing	3	United States	A1	7.7	224	4.81 (Q1)
Business Strategy and the Environment	2	United States	A1	12.5	147	3.66 (Q1)
Journal of Business Research	2	United States	A1	10.5	265	3.12 (Q1)
Cross-Cultural	2	United	A2	2.3	48	0.86 (Q1)

Research		States				
International Journal of Entrepreneurship and Innovation Management	2	England	Not classified	0	32	0.23 (Q3)

Source. Research data

Although the results showed that no journal worldwide can be considered a reference on the intersections between national culture and innovation, Table 3 shows that the journals that published more on the topic are predominantly high-impact journals. Figure 2 illustrates the country of origin of the 65 scientific journals analyzed. Those countries marked in the illustration with larger blue bubbles are the countries of origin for the highest number of journals. The United States and England were the prominent countries concerning the number of scientific journals publishing on national culture and innovation jointly, with 18 and 13 respective journals.

Figure 2. Country of origin of the analyzed journals



Source. Research data

4.4 Economic sectors where studies were developed

Considering only theoretical-empirical studies with field research, that is, excluding studies with secondary data and purely theoretical studies, we classified articles according to the economic sector where data were collected: first sector (public), second sector (private), or third sector (foundations and non-governmental organizations). Table 4 presents data regarding the economic sectors where such studies were developed.

Table 4. Economic sectors where studies were developed

Sector	Representativeness
1st sector (public)	17%
2nd sector (private)	83%
3rd sector (foundations and NGOs)	0%

Source. Research data

Table 4 shows that theoretical-empirical studies with field research investigated intersections between national culture and innovation especially in the private sector (83%). Therefore, as an opportunity for further research, we suggest this topic be more intensely explored in the first and third sectors, the latter without studies identified in this bibliometrics. It is relevant to highlight that innovation is a topic of interest in the third sector. Studies have explored the particularities and importance of innovation in foundations and non-governmental organizations (Hayton, 2024; Clifton, Kyaw, Liu, & Walpole, 2024; Yung, 2023). However, as pointed out in this bibliometrics, intersections between national culture and innovation in the third sector are not frequent and represent a new research possibility.

4.5 Framework of publications

We also framed the publications within theoretical research and theoretical-empirical research. Table 5 summarizes the results.

Table 5. Framework of publications

Framework	Number of articles	Representativeness
Theoretical research	11	15%
Theoretical-empirical research	62	85%

Source. Research data

The findings indicate a need for more theoretical studies on the intersections between national culture and innovation. Theoretical approaches are relevant because they allow predictions to be hypothesized less contortly and more coherently. Furthermore, theoretical studies allow constructs to be defined in a more refined and precise way. Developing a knowledge field begins with a solid theoretical framework to produce new insights (Shaw, 2017).

As an example of purely theoretical studies identified in this bibliometrics, we can mention the research developed by Sivakumar and Roy (2019) on the influence of national culture on developing new products. The guiding question of the study was: what happens when the global development of new products takes place between buyers and sellers from different cultures? Through this theoretical research, the authors proposed a conceptual model of the moderating role of national culture between the interactions of buyers and sellers from diverse countries and the development of new products. The authors highlighted the importance of thinking about national cultures in innovation management, especially in times of globalization. In turn, Lin (2013) developed a theoretical study on the obstacles of national culture to the innovative development of countries. This study allowed the author to propose a theoretical model of

China's propensity for innovation based on Hofstede's (2001) cultural dimensions and the partnerships it promotes with other countries.

4.6 Approaches to the research problem

The articles were classified according to the type of research, considering the approach to the problem: quantitative, qualitative, or multi-method (quali-quanti) research. Table 6 summarizes the results.

Table 6. Approaches to the research problem

Type of research	Number of articles	Representativeness
Quantitative	55	75%
Qualitative	15	21%
Multi-method (quali-quanti)	3	4%

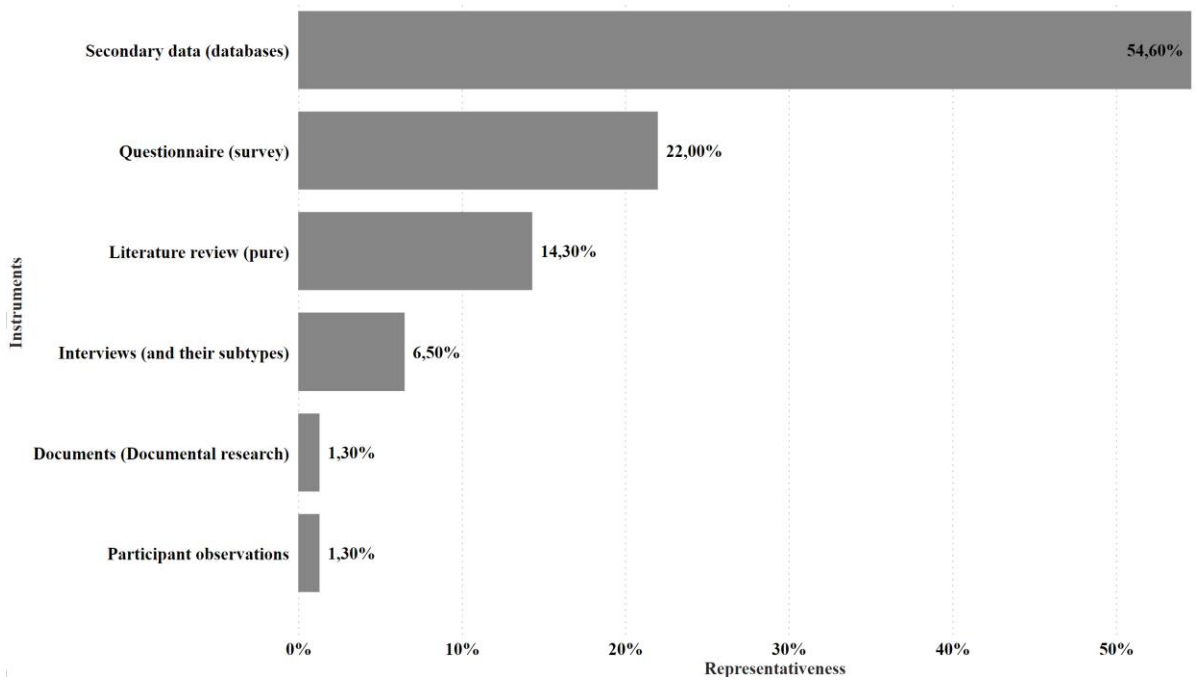
Source. Research data

The findings suggest a need for more qualitative and multi-method (quali-quanti) studies. An example of a qualitative study identified in this bibliometrics was the research developed by Setiawan (2020), which explored, through interviews, the influence of Indonesia's national culture on its innovation. An example of a study that combined qualitative and quantitative (multi-method) approaches was carried out by Rauch et al. (2013), which explored innovative characteristics of 857 entrepreneurs in five countries. The findings showed that national culture mediates organizational innovation and growth. Structured interviews were analyzed qualitatively, while questionnaires and secondary data were analyzed quantitatively. According to Yin (2001), case studies are enriched and deepened when they adopt the so-called data triangulation, which intertwines data collected from different sources and forms, as Rauch et al. (2013) did by extracting secondary data and collecting data from individual structured interviews.

4.7 Data collection instruments adopted in the studies

Most publications that intersect national culture and innovation use secondary data (databases) in their investigations (54.6%). The questionnaire (survey) also proved to be relevant as a data collection instrument in research on these themes (22%), which is compatible with the majority of quantitative studies (75%) highlighted previously (Table 6). Graph 2 presents the other data collection instruments adopted.

Graph 2. Data collection instruments

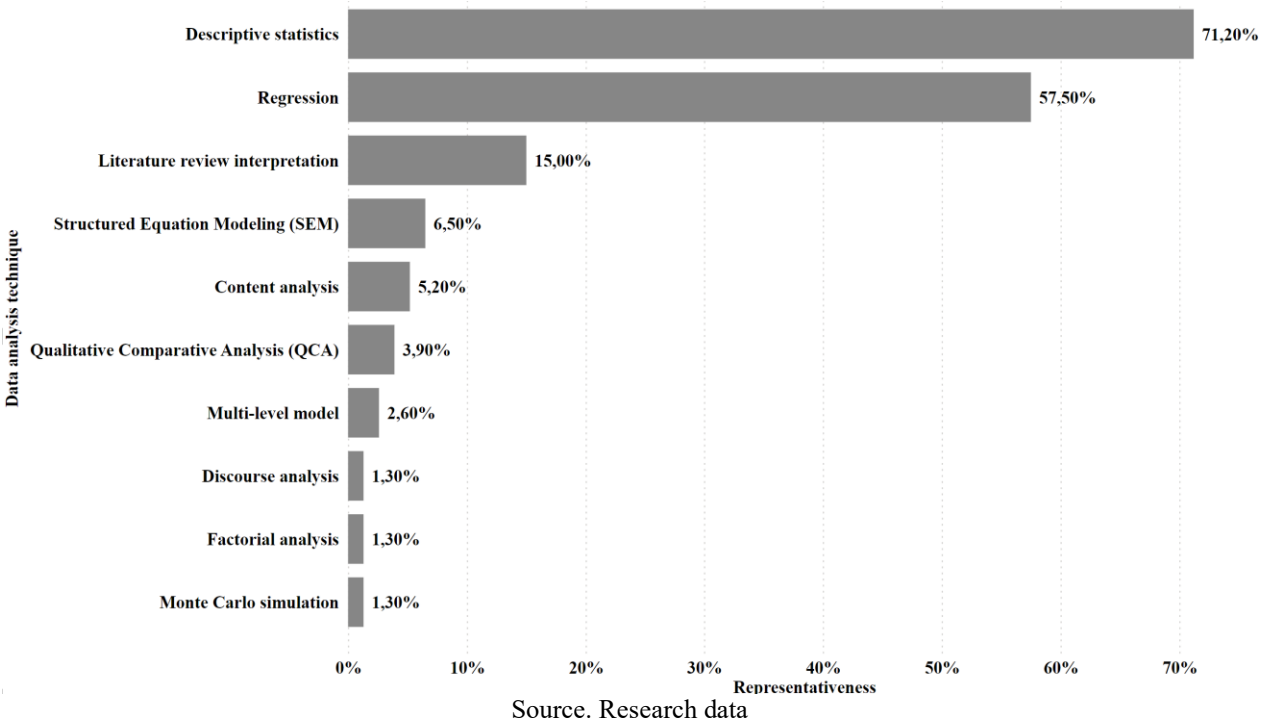


Source. Research data

4.8 Data analysis techniques adopted in the studies

Most articles intersecting national culture and innovation use descriptive statistics (71.2%) and regressions (57.5%) as quantitative data analysis techniques. It is necessary to point out that most studies that adopted regression techniques also used descriptive statistics, commonly adopted as a preliminary step for regression tests. Such findings are also compatible with the fact that most studies analyzed in this bibliometrics are quantitative (75%) (Table 6). Thus, smaller proportions adopted typical qualitative data analysis techniques, such as content analysis (5.2%) and discourse analysis (1.3%), frequently used when empirical data are collected through interviews. Graph 3 summarizes the data analysis techniques adopted in the articles.

Graph 3. Data analysis techniques



Source. Research data

4.9 Thematic focus of articles

The analysis of articles allowed us to identify three main thematic focuses: (a) studies that intersect national culture with innovation at the individual level, addressing innovative individual values, attitudes, and behaviors; (b) studies that intersect national culture with innovation at the organizational level; and (c) studies that intersect national culture with innovation at the national level. Table 7 summarizes these thematic focuses and their respective representation. Only two studies adopted more than one thematic focus simultaneously.

Table 7. Thematic focus of articles

Thematic focus	Number of articles	Representativeness
National culture x Individual innovation	8	11.0%
National culture x Organizational innovation	26	35.6%
National culture x National innovation	41	56.2%

Source. Research data

As Table 7 shows, most articles approach national culture and its relationships with innovation rates at the national level (56.2%). On the other hand, an unrepresentative number of studies (11.0%) intersect national culture and innovation at the individual level, addressing innovative individual values, attitudes, and behaviors, representing a gap to be filled by further studies.

An example of a study that intertwined national culture and innovation at the individual level was developed by Hemesath and Tepe (2024). The authors investigated innovative characteristics of individuals in the United States, Japan, and Germany. The innovative characteristics investigated

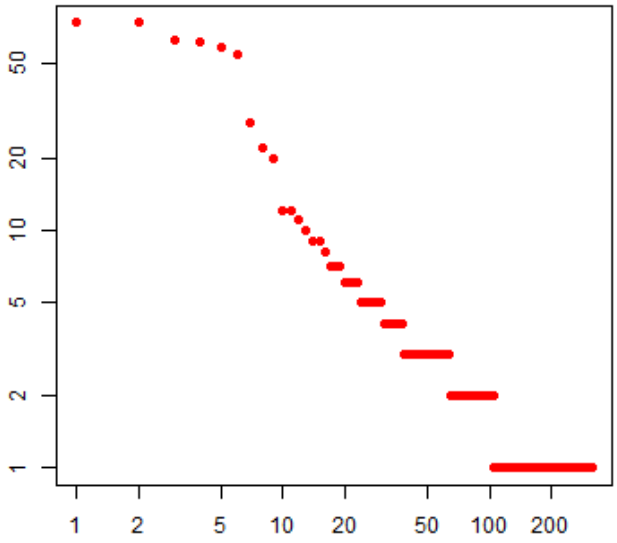
were technological risks (disruptive innovations). Some individual preferences varied according to the country analyzed.

The study carried out by Yao et al. (2023), in turn, exemplifies research that intertwines national culture and innovation at the organizational level. The authors investigated the role of national culture in organizational innovation in 304 companies in 13 countries. Finally, an example of a study that intertwined national culture and innovation at a national level was developed by Bonetto, Pichot, and Adam-Troian (2022). The authors collected evidence from 106 countries on the role of cultural values in national innovation indices. Countries characterized by high scores in the cultural dimension of Long-Term Orientation and low scores in the cultural dimension of Uncertainty Avoidance showed better results in terms of national innovation.

4.10 Lexicographic analysis of article titles

The textual corpus with the titles of the 73 articles reached 332 forms (number of different words) and 1,006 occurrences (number of words). Graph 4 presents the frequency behavior of words in the textual corpus, where the horizontal axis (X) shows the number of different words, and the vertical axis (Y) shows the number of times the words appeared (Camargo & Justo, 2018). For example, by analyzing the top left corner of Graph 4, we infer that six words from the textual corpus (six red dots) appeared with a frequency equal to or greater than fifty times.

Graph 4. Frequency of forms and occurrences of article titles



Source: Research data

The content of the article titles was represented by a word cloud, illustrated in Figure 3. In this representation, the most frequent words are highlighted.

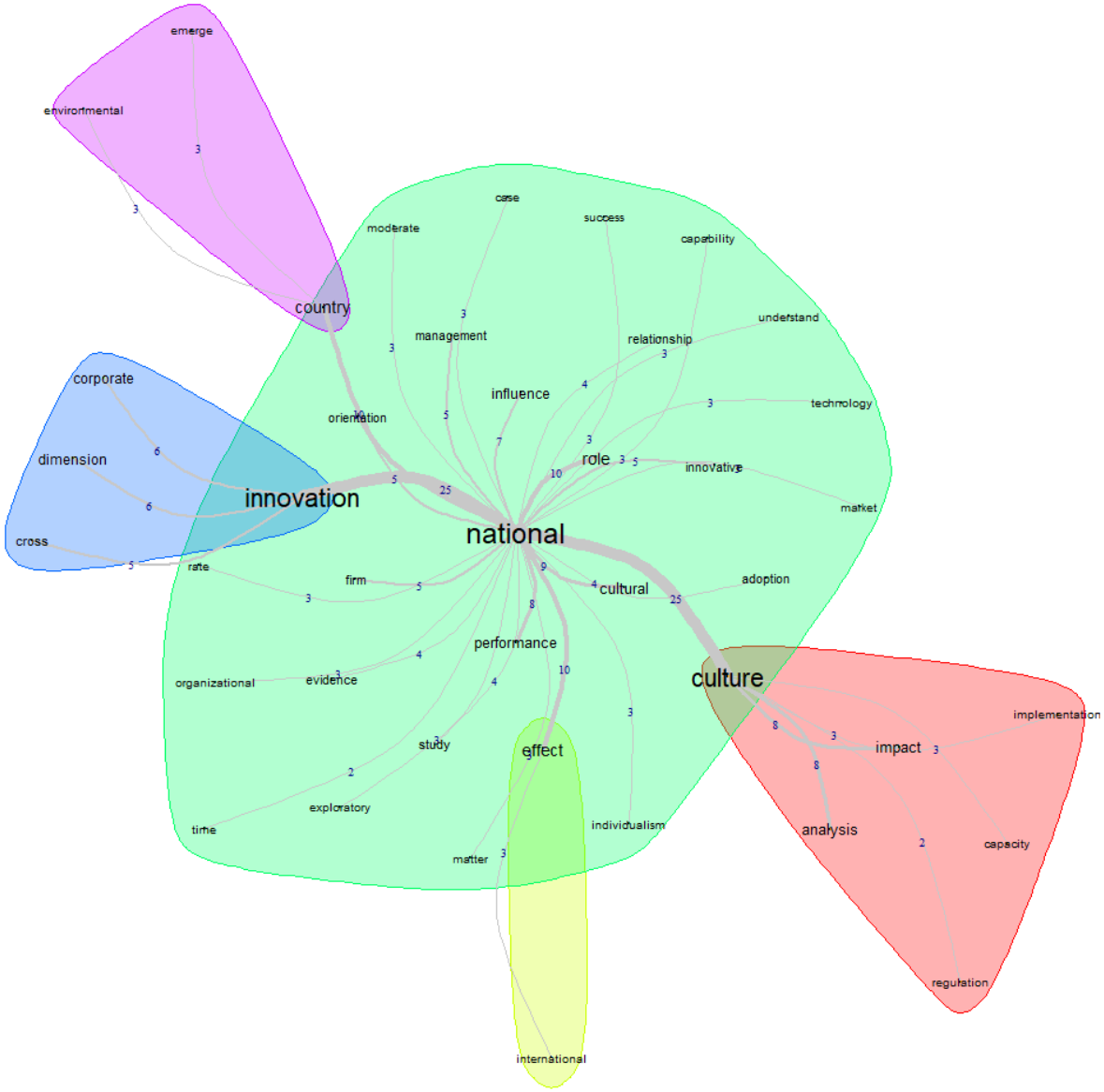
Figure 3. Word cloud of article titles

Source: Research data

In addition to the words that comprised the search strings of this bibliometrics (“innovation” and “national culture”), words such as “role”, “impact”, “influence”, and “effect” were frequent, which indicates that most studies analyzed are prediction studies investigating the influence of national culture on innovation.

Furthermore, we proceeded with a Similitude Analysis, which explores the strength of connection between the words of a textual corpus, with the thickness of the branches illustrated in the graph expressing the strength of connection between the words, as well as the strength of connection between groups of words among themselves, called communities. The numbers on the branches between the words indicate the number of times they were mentioned together in the textual corpus (co-occurrences). Figure 4 illustrates the Similarity Analysis for the article titles.

Figure 4. Similarity Analysis for the article titles

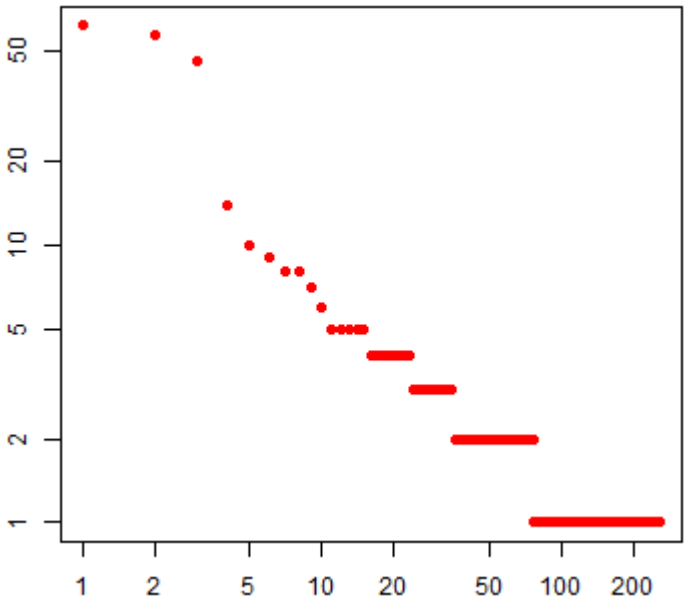


Source. Research data

4.11 Lexicographic analysis of article keywords

The textual corpus comprised of all keywords from the 73 articles analyzed totaled 263 forms (number of different words) and 583 occurrences (number of words). Graph 5 shows the word frequencies in the textual corpus. For example, by analyzing the top left corner of Graph 5, we infer that two words in the textual corpus (two red dots) appeared with a frequency equal to or greater than fifty times.

Graph 5. Frequency of forms and occurrences of article keywords



Source. Research data

The article keywords were represented by a word cloud, illustrated in Figure 5. In this representation, the most frequent words are highlighted.

Figure 5. Word cloud of article keywords

Source. Research data

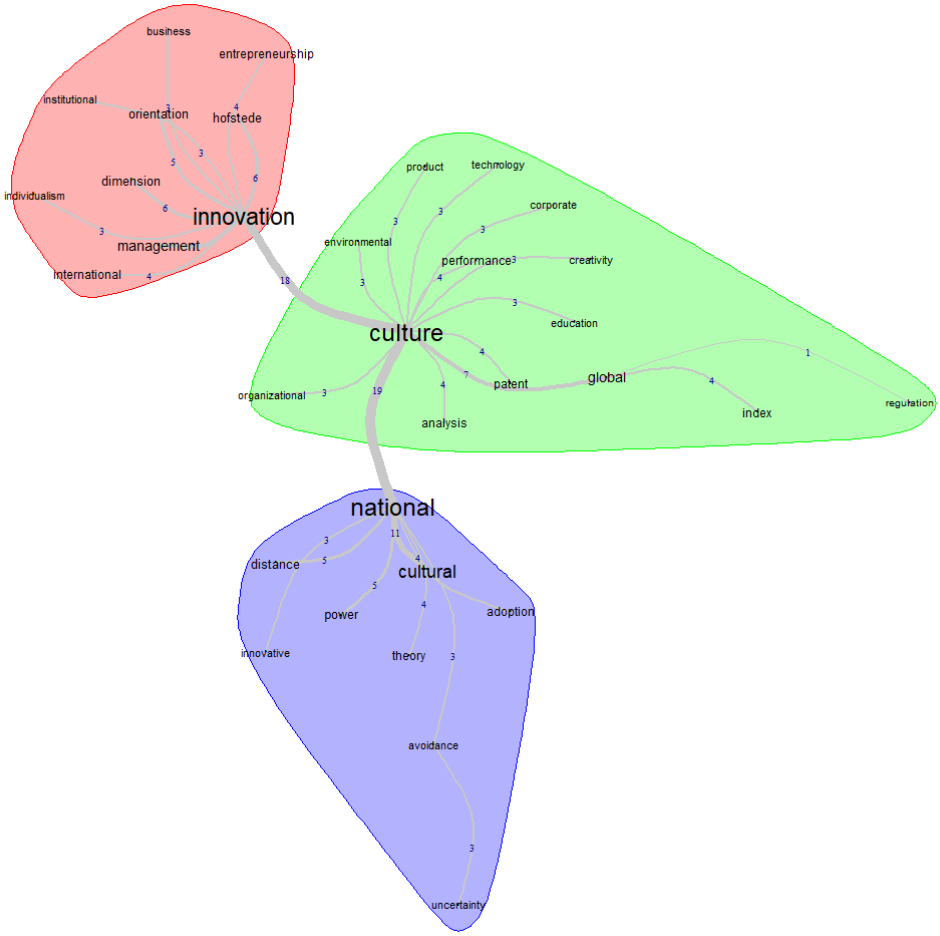
In addition to the words that comprise the search strings of this bibliometrics (“innovation” and “national culture”), words such as “entrepreneurship” were frequent. Innovation is a typical characteristic of entrepreneurial individuals. They explore changes as an opportunity to create businesses and offer differentiated services. We can consider innovation a discipline capable of being learned and practiced (Drucker, 1985). According to Schumpeter (1934), the entrepreneur is the one who generally initiates economic change. Hovne, Hovne, and Schøtt (2014) highlight

that national policies that promote entrepreneurship benefit innovation at an individual and national level.

It is also worth highlighting that keywords representing the cultural dimensions proposed by Hofstede (2001) were frequent, such as Individualism, Uncertainty Avoidance, and Power Distance, dimensions that are widely adopted in cross-cultural studies, that is, in studies that investigate the possible influence of national culture on values, attitudes, and behaviors (Athayde & Coutinho, 2023).

At last, we proceeded with Similarity Analysis to express the connection strength between the article keywords, as well as between the groups of words among themselves. Figure 6 illustrates the Similarity Analysis for the article keywords.

Figure 6. Similarity Analysis for the article keywords.



Source. Research data

5 Conclusion

As previously mentioned in the introductory section, our argument in this paper was not to demonstrate the importance and benefits of innovation, whether at the individual, organizational, or national level. There is no doubt about that, and the literature already demonstrates this relevance almost exhaustively. Our question and provocation, through this research, was: since innovation is such an important topic, and considering that strong theoretical and empirical evidence in the literature has demonstrated that national culture influences values, attitudes, and behaviors, has national culture been satisfactorily investigated in conjunction with innovation? Is this intersection already a mature field of research in the international literature? The answer is "no". There still much room for further exploration. We hope that the presented data have been persuasive in supporting this conclusion.

The results of this study demonstrated that the field of research regarding the intersections between national culture and innovation can still be considered developing in the world, which translates into a relevant gap in the literature, given the strategic relevance of national culture for innovation at individual, organizational, and national levels. Although studies that simultaneously investigate national culture and innovation can still be considered scarce, the research showed that this is a growing topic. However, this rise has not yet been able to generate leading authors, universities, and scientific journals. It is interesting to note that, among the articles selected and analyzed, the majority deal with the influence of national culture on national innovation indices, with the minority investigating the impact of national culture on individual innovation characteristics, which constitutes a thematic opportunity for further research.

Regarding methodological aspects, this bibliometric study demonstrated that researchers worldwide opted, for the most part, for quantitative theoretical-empirical studies in the private sector supported by secondary data, adopting descriptive statistics and regressions as primary data analysis techniques. Therefore, the following research agenda on the intersections between national culture and innovation is suggested: to develop studies in the first and third economic sectors, promoting qualitative and multi-method research and investigations with little explored thematic focuses, such as the influence of national culture on innovation at the individual and organizational levels.

The development of multi-method studies, which mix qualitative and quantitative approaches, enables the well-known methodological triangulation, allowing for a better understanding of the phenomenon. Such studies will allow for a broader understanding of the effect of national cultures on innovative values, attitudes, and behaviors and national and macroeconomic indices of innovation, methodologically supporting how we should foment innovation in a multicultural scenario. Finally, we suggest developing theoretical essays aiming at greater dissemination and understanding of the specific topic, as this type of study was not frequent in the publications analyzed.

This research contributes to the culture and innovation fields, pointing out paths for developing the theme through future studies. Another contribution of the research concerns identifying the need to institutionalize the topic in the world. Some limitations of the study can be identified. It does not exhaust literature regarding other publication types, such as books, dissertations, and

theses. We prioritized articles in scientific journals once research published in event proceedings is considered a work in progress.

We hope this article has contributed so that other discussions and research can be derived from its findings. After all, the fact that the topic is little studied in the world brings, in itself, great research opportunities that can provide a scientific basis for innovation management, making it more effective and culturally adapted.

This article does not claim that national culture is the primary predictor of innovation, whether at the individual, organizational, or national level. Rather, we urge that future explanatory models of innovative values, attitudes, and behaviors not overlook cultural variables and include them as antecedents, as has already been done with other types of variables. Furthermore, we suggest that qualitative research address cultural aspects when deeply investigating perspectives on innovation. At last, we reinforce our invitation, expressed in the title of this paper: "Please, next time you deal with innovation, do not close your eyes to national culture".

Acknowledgements

The authors would like to thank the Minas Gerais State Research Support Foundation (FAPEMIG) for the financial support for the development of this study.

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