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Psychological Capital, Systems Thinking, and Sustainable Work Behaviors: A Bibliometric Analysis of Intellectual Structure and Research Trends

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Abstract

This study undertakes a bibliometric analyze to explore the relationship between the concepts of psychological capital, systems thinking and sustainable work behaviors, each of which had been subject to extensive research in isolation but were previously linked together only at a theoretical level. A Scopus search for the relevant keywords resulted in 318 publications found in the database over the twenty-year period prior to the study. These items were subjected to analysis using the Bibliometric R Package to identify trends in publications, authors, journals, institutions, countries, keywords, and themes. It was found that this field of research has seen a substantial increase in interest, with the number of publications increasing by 23.71% per year on average after 2020. The journals sustainability (Switzerland) and Frontiers in Psychology were found to be the most common, with 30.74% of all articles published in them. The majority of articles addressed topics related to sustainable development, human behavior, and psychology. Nevertheless, the concepts of systems thinking and psychological capital were not detected as separate keywords, clusters, or themes in any of the analyzed items. By demonstrating that research into the psychological and systemic aspects of sustainable work behaviors is a relatively recent development with significant room for further studies, this bibliometric analyze lays the groundwork for future research, including an empirical study into the impact of these factors on the performance of a commercial bank.

Keywords: psychological capital, systems thinking, sustainable work behaviors

1. Introduction

Contemporary organizations function in a dynamic environment, where the ability to navigate through constantly changing and complex situations is often determined by the psychological resources of their personnel and their capacity to understand the interrelated challenges, rather than just the financial and technical resources (Luthans & Youssef-Morgan, 2017). In addition, the tendency of organizations to integrate environmental responsibility into their daily operations increases the importance of individual behavior for attaining sustainability (Zacher et al., 2023). These two imperatives - to foster the psychological strengths of employees and to realize the commitments of the organization in terms of environmentally sustainable actions - have been recognized as interconnected challenges in management practice. This interconnectedness is grounded in the fact that both issues concern motivating employees and providing them with behavioral frameworks that allow them to operate efficiently within the organization. The way employees can use their psychological resources while understanding the interrelated challenges presented by the system in which they function to engage in sustainable behaviors is an important topic of research, which has seen a significant increase in scholarly interest in the last decade (Pham et al., 2024; Miah et al., 2025). The subsequent sections will present each of the three concepts in detail, followed by an exploration of the relationships between them and an identification of the gap in the existing scholarly literature.

Psychological capital (PsyCap) is defined as an individual's positive psychological state of development which comprises hope, self-efficacy, resilience, and optimism (HERO) (Luthans et al., 2007). Each component relates to a particular psychological resource; hope is a feeling of eagerness and the confidence in attaining the desired outcomes and the ability to find a way to achieve them; self-efficacy is a certain level of confidence in one's skills and ability to succeed; resilience is the capacity to recover from any shortcomings; optimism is a tendency to anticipate the best outcomes in a wide range of situations. Unlike personality resources, psychological capital is regarded as a state-like resource that can be developed and invested in, which makes it an attractive area for research and practical application (Luthans & Youssef-Morgan, 2017). The construct of psychological capital has been linked to numerous organizational outcomes. Bhatnagar and Aggarwal (2020), in

their study, examined the role of psychological capital in employees' eco-initiative behavioral tendencies (EIBT) and established that psychological capital was positively related to EIBT with meaningfulness of work serving as a mediator.

Systems thinking is defined as the ability to think in terms of patterns, interactions and interdependencies rather than just individual events (Dolansky et al., 2020). Rather than focusing on causes and effects as independent entities, systems thinking concentrates on feedback loops and emphasizes the long-term and often unfelt impact that any actions within an organization can have on its other elements. First introduced to the fields of management and leadership by senge (1990), systems thinking is described as the art of leveraging other disciplines and processes, such as shared vision and collective learning, thus making the entire organization greater than the sum of its parts. Later, systems thinking started being regarded as a competency that needs to be acquired to address sustainability issues; specifically, it is considered to be thinking that recognizes the implications of individual actions for a complex whole (Wiek et al., 2011). This reframing proposes that the same capability for systemic reasoning that underpins organizational learning capability is integral to employees' ability to respond to their environmental awareness with behavioral change.

Sustainable work behaviors, most often investigated in the literature under the umbrella term of employee green behavior (EGB), refer to employee-initiated actions, which have significant potential to either promote or diminish sustainability at work (Ones & Dilchert, 2012). Such organizational behaviors can be grouped into five categories termed the "Green Five" which include conserving resources, innovating work processes, avoiding negative influence, influencing processes, and initiating processes (Ones & Dilchert, 2012), a taxonomy that captures both the more voluntary and discretionary forms of green behaviors, as well as those related to roles and expectations of employees by the organization. As the issue of ecological sustainability becomes an important priority for organizations, employee green behaviors are increasingly viewed as one of the key ways to achieve organizational sustainability (Zacher et al., 2023). There is a significant amount of research that has already identified individual and organizational predictors of this behavior (Katz et al., 2022).

Although the topics of psychological capital, systems thinking, and sustainable work behaviors have been studied extensively, each as an independent field, there is a growing interest and need to explore the relationships between these concepts. Researchers have concluded that when people find their work meaningful, they are more likely to use their psychological resources to engage in sustainable work behaviors (Bhatnagar & Aggarwal, 2020; Chen & Tang, 2023).

However, the associations between systems thinking and sustainable work behaviors have been mainly postulated rather than tested. According to Wiek et al. (2011), systems thinking plays a vital role in understanding the context and consequences of one's actions, especially when these actions affect complex systems such as organizations and the environment. However, there is no consensus on how exactly systems thinking is related to sustainable work behaviors. It is unclear whether systems thinking is one of the antecedents of sustainable work behaviors, systems thinking moderates the relationship between psychological capital and sustainable work behaviors, or systems thinking is merely correlated with psychological capital in predicting sustainable work behaviors.

There seems to be a dearth of literature that studies psychological capital, systems thinking and sustainable work behaviors together. The findings of the two bibliometric studies independently conducted for the present article support this claim; while pham et al. (2024), in their analysis of 2244 psychological capital publications, found no mention, keyword, cluster, or theme in any of the publications of systems thinking. Miah et al. (2025) also in their bibliometric review of 752 pro-environmental behaviors and organizational sustainability articles, found that systems thinking was not a keyword, cluster, or theme in any of the publications. Additionally, at the level of specific predictors, Katz et al. (2022), in their analysis of the variables associated with employee pro-environmental behaviors previously tested and supported, found no mention of either psychological capital or systems thinking. Thus, based on the bibliometric evidence, it is reasonable to conclude that this omission is indicative of a real gap in the research literature rather than an oversight.

Bibliometric analyze can be applied to a similar field of study, namely the relationship between psychological capital and pro-environmental behaviors, as suggested by other researchers (Miah et al., 2025; Pham et al., 2024; Windyanty et al., 2025). Therefore, it seems reasonable to apply a similar bibliometric analysis of the field at the intersection of psychological capital, systems thinking, and sustainable behaviors, which, as discussed above, has not been explored in the literature in any detail before.

2. Theoretical Framework

The above variables of the research are theoretically linked with the Job Demands–Resources (JD-R) model (Demerouti, Bakker, Nachreiner, and Schaufeli, 2001), which explains how a people's well-being and performance result from the balance between job demands and job resources. Job demands are physical, emotional, or cognitive aspects of a job that require sustained effort (e.g., workload, time pressure, customer complaints, ethical dilemmas). Job resources are physical, social, or psychological aspects that help achieve work goals, reduce demands, or foster growth (e.g., autonomy, social support, feedback, psychological capital). Empirical research has substantiated the significant impact of psychological capital within the JD-R framework. In alignment with the JD-R model, this research proposes that psychological capital, as a key personal resource, enables people to engage in systems thinking, which subsequently enhances their sustainable work behaviors.

3. Objectives

The present study has the following objectives:

1. To analyze the publication trends and growth pattern of research on psychological capital, systems thinking, and sustainable work behaviors over time.
2. To identify the most influential authors, journals, institutions, and countries contributing to these three research domains.
3. Examine the keyword co-occurrence and thematic clusters within and across the three constructs to understand their conceptual evolution.
4. Map the extent of intellectual overlap or disconnect between psychological capital, systems thinking, and sustainable work behaviors literature through co-citation and bibliographic coupling analysis.
5. Identify the thematic gaps and underexplored intersections among these constructs, particularly within organizational and employee-behavior.

4. Methods

A bibliometric analysis was conducted using the Scopus database. The keyword string used for data extraction was "("psychological capital" OR "psycap") AND ("systems thinking" OR "systemic thinking" OR "systems approach" OR "systems perspective") AND ("sustainable work behavior" OR "sustainable work behavior" OR "workplace sustainability" OR "pro-environmental behavior" OR "pro-environmental behavior" OR "green behavior" OR "green behavior" OR "sustainable performance")". Data were filtered for the last 20 years. A total of 318 documents were extracted for the analysis. For the analysis, the Bibliometric R Package (RStudio) was used (Aria & Cuccurullo et al., 2017). The final year (2026) is omitted from the Compound Annual Growth Rate (CAGR) calculation due to incomplete data, preventing it from skewing the average growth rate (23.71%).

5. Results



Figure 1. Analysis

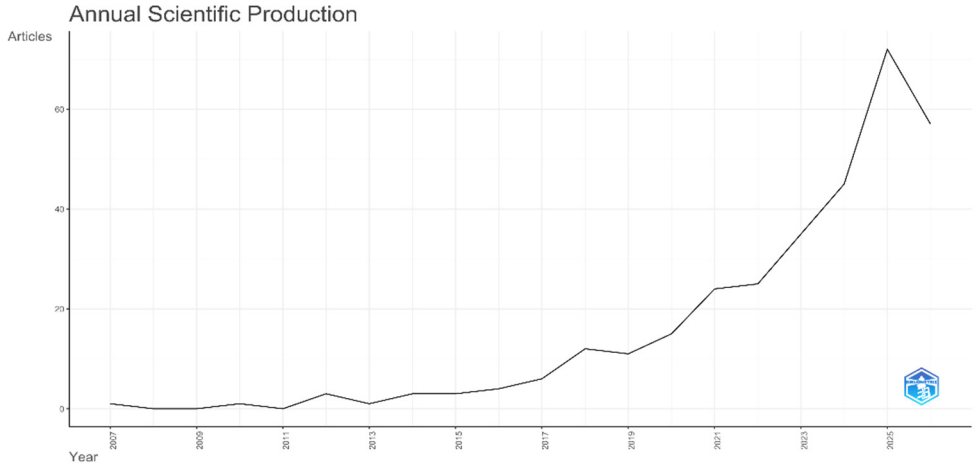


Figure 2. Annual scientific production

The annual scientific production shows the number of articles published from 2007 to 2026. The horizontal line shows the years, and the vertical line shows the number of articles published. In figure 2, the number of publications was small from 2007 to 2017. In 2007, only 1 publication was reported, with no publications reported in 2008 and 2009. A single publication was published in 2010 and 2012, which depicted 3 publications. The number of publications increased slowly from 1 to 4 articles per year from 2013 to 2016, indicating a start to regular research interest. In 2017, the field grew even more and in 2018, the field saw a large increase in publications, as well as increasing in 2019 with 11 publications. Starting from 2020, the number of reports has significantly increased from 15 publications in 2020, 24 publications in 2021, 25 in 2022 and 35 in 2023. In 2024 and 2025 the most scientific production took place, with over 60 publications produced in both years, reflecting the significance of this research. In 2026, there are fewer publications, as this is an incomplete year. Overall, the study suggests that this topic has matured from an underexploited area into a promising area with increased attention being paid in academia around the world.

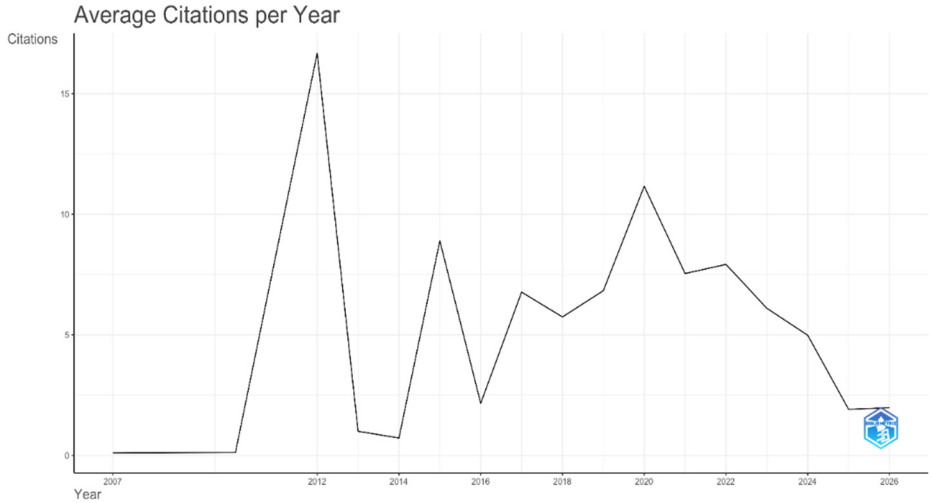


Figure 3. Average citation per year

Table 1. Total Citation Per Article

Year	Mean TC Per Article	N	Mean TC per year	Citable year
2007	2	1	0.1	20
2010	2	1	0.12	17
2012	250	3	16.67	15
2013	14	1	1	14
2014	9.33	3	0.72	13
2015	106.67	3	8.89	12
2016	23.75	4	2.16	11
2017	67.67	6	6.77	10
2018	51.67	12	5.74	9
2019	54.64	11	6.83	8
2020	78.13	15	11.16	7
2021	45.21	24	7.54	6
2022	39.6	25	7.92	5
2023	24.4	35	6.1	4
2024	14.93	45	4.98	3
2025	3.81	72	1.91	2
2026	1.98	57	1.98	1

The annual citation per year is based on the average number of citations to an article for each year of its publication history. The results indicate that in 2012, only 3 articles received a mean of 250 citations, were totalized of an average article as compared to 16.67 citation on an average of 16.67 citations per year, making 2012 the year of the publication in terms of citation impact. Likewise, the number of publications in 2015 had a mean of 106.67 articles and 8.89 citations per year, respectively, and in 2017, publications had a mean of 67.67 citations and 6.7 years, respectively. Also, research published in 2018 and 2019 shows great influence, with the average number of citations per article being 51.67 and 54.64, respectively. A lower count of citations is to be expected in the most recent publication, as these have not had as many years to be cited. As we can show in the figure, in 2007 only one publication had two citations, and in 2010 only one publication had two citations, while 2026 publications have no or no number of citations because they are recent publications. The results show that most of the studies that had an impact on the development of the discipline were published between 2012 and 2019, with new year studies gaining citations over time (Figure 3, Table 1).

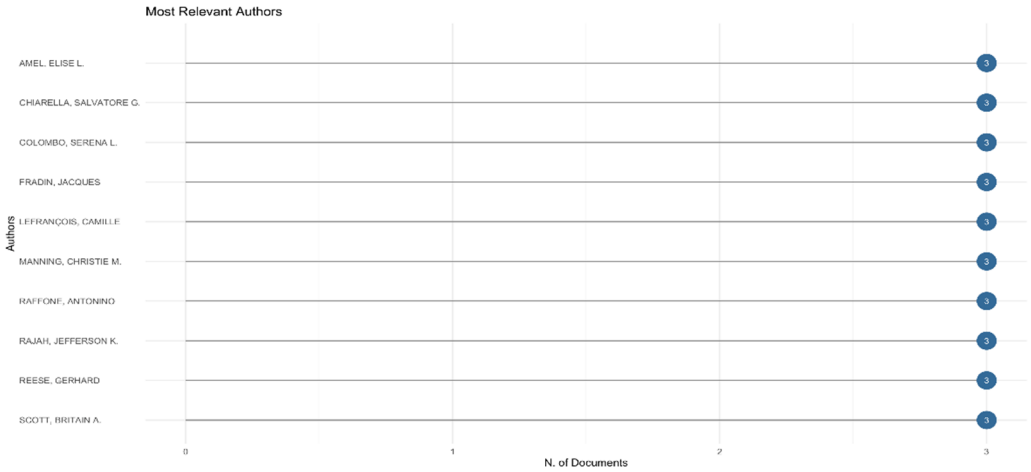


Figure 4. Most relevant authors

The most relevant authors *(figure 4)* are ranked by the number of publications in the bibliometric set that each researcher has published. It can be seen that there are no clear hotspots in the field, with 10 authors each only contributing about 3 publications. Amel, Elise L., Chiarella, Salvatore G., Colombo, Serena L., Fradin, Jacques, Lefrancois, Camille, Manning, Christie M, Raffone, etc. The similarity in publication numbers among these authors indicates that the research field is very collaborative in character, with many independent research groups contributing to the literature rather than a small number of prolific authors. This even distribution of authors across disciplines suggests the interdisciplinary nature of sustainability psychology research and demonstrates that knowledge is not only being developed individually by researchers from various institutions, but also collectively across countries.

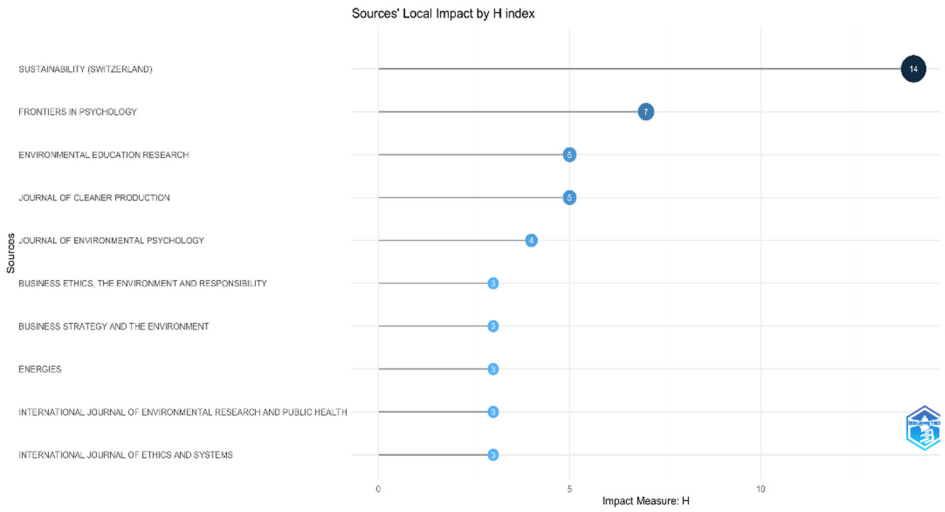


Figure 5. Source local impact

Figure 5 shows the sources' local impact by H-index measures, which quantifies how influential journals are based on their H-index, which considers both publication rate and impact. Sustainability (Switzerland) has the highest H-index, with 14, significantly higher than all other journals, and reinforces the journal's influence in the dataset. Frontiers in Psychology (Journal) has a comparable index of about 7 and publishes regularly highly cited articles. The Environmental Education Research and Journal of Cleaner Production have an H-index of approximately 5, which is an important contribution to the literature. The Journal of Environmental Psychology has an H- index of nearly 4, and 3 other journals: Strategy and the Environment Business Ethics, The Environment and Responsibility, Energies, International Journal of Environment Research and Public Health. The figure illustrates that there are many journals publishing research in the field, but only a few have regular articles that attract scholarly interest. Thus, Sustainability (Switzerland) can be regarded as a journal at the heart of the field.

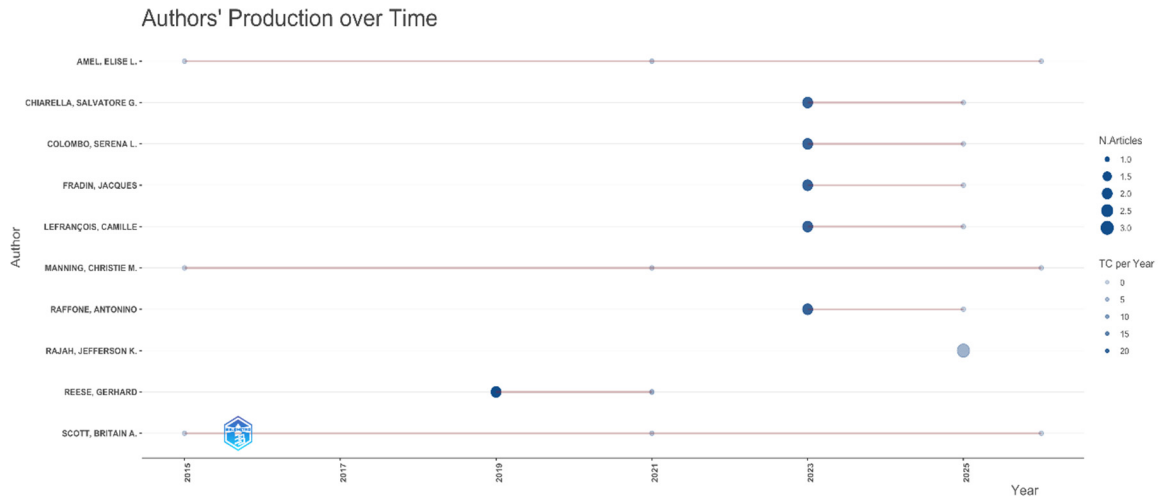


Figure 6. Authors' production over time

The authors' production over time shows the number of publications of the Top 10 authors of the various years, and the size of the bubble reflects the number of citations received by their publications. The overall time trend of publications of the main authors is from 2024 to 2026, indicating the dynamic growth of this research field. Recent publications (Elise L. Amel, Christie M. Manning, and Britain A. Scott) do not have many citations due to their relative newness. In 2025, publications continued with the topic: Serena L. Colombo, Camille Lefrancois, Jacques Fradin, Salvatore G. Chiarella, and Antonino Raffone. Earlier authors, like Jefferson K Rajah, have a more prominent citation bubble, which suggests that their works have already started to have an impact on the research community and be cited. The overall picture shows a continued level of author productivity over the past several years and indicates that the field of authors, while established, continues to have a high rate of publications (Figure 6).

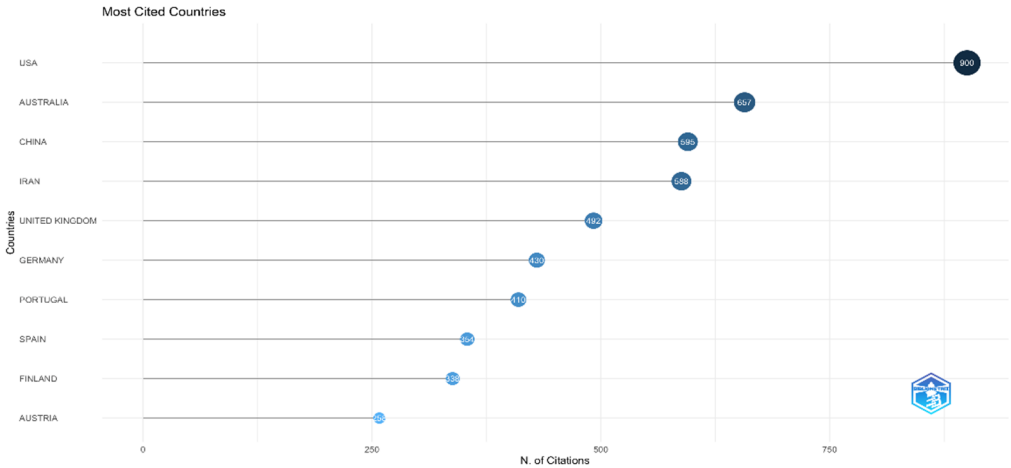


Figure 7. Most cited countries

The most cited countries show the scientific impact of countries according to the total number of citations received by publications from these countries. The highest ranking is the USA, where around 900 citations are found, which means that the country is the best known and most influential internationally. Australia is the second with approximately 657 citations, followed by China and Iran, which received 595 and 588 citations, respectively. There is a slight difference between China and Australia in terms of citation impact, with China producing a higher number of publications and Australia a higher number of citations, but this may be a function of the average number of citations per publication. The United Kingdom has about 492 citations, and Germany is next with 430 citations. The other countries that had a significant footprint are Portugal with 410, Spain 154, Finland 338 and Austria 258. This figure shows that research influence is not exclusively based on the number of publications, as some countries with comparatively small publication output have achieved high impact of publication influence in research. Overall, the distribution shows that North America, Europe and Australia remain the world leaders in resurging impact on this topic.

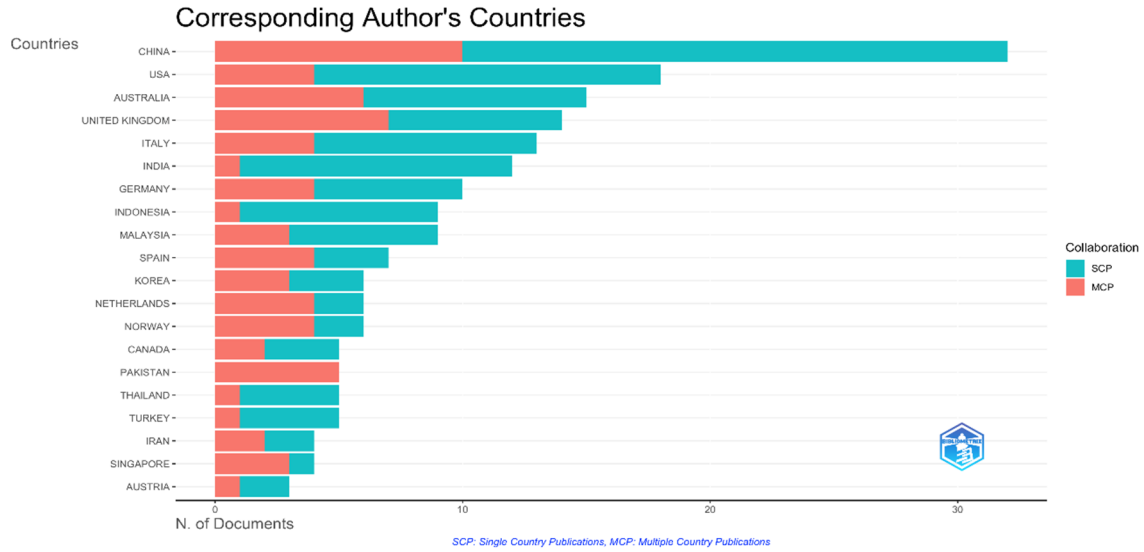


Figure 8. Corresponding author's countries

The corresponding author's countries graph shows the geographical distribution of the research leadership and the level of international cooperation, both in terms of single-country production (SCP) and multiple-country production (MCP). The great majority of these corresponding authors' papers have been published by the Chinese, with about 32 and some 22 of which are SCPs, and 10 are MCPs. This reflects the higher productivity of the Chinese research effort and the significant level of international collaboration. The United States has about 18 publications, followed by Australia with 15 publications and the United Kingdom with 14 publications. India is one of the top contributors with approximately 12 publications as corresponding authors, with very limited international collaboration, as the majority of these publications are single-country productions. The number of publications in other countries is considerable as well, but comparatively smaller, including Germany, Norway, Malaysia, Italy, South Korea, Mexico, and Pakistan. The SCP bar is dominant in most countries, indicating that there is a strong research focus on national research, although in some European countries and in China, international collaboration is most prominent. The overall result is an indicator of the global character of the field of research and its potential for growth of global corporations, especially in developing countries.

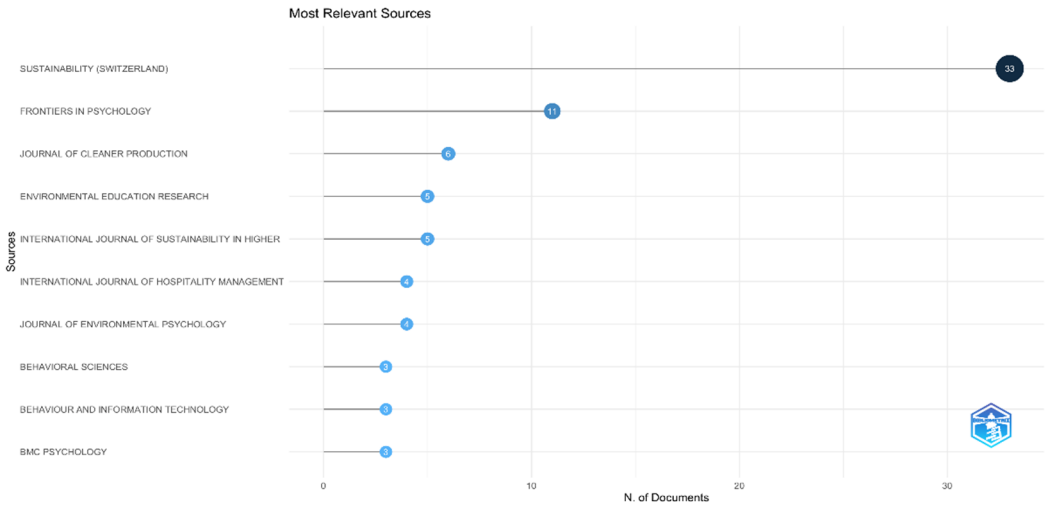


Figure 9. Most relevant sources

The most relevant source (Figure 9) shows the journal with the largest number of documents in the field of research. The image illustrates that Sustainability (Switzerland) is by far the most important source of publications, with 33 documents well in the lead from all other journals. This means that the journal is emerging as a key medium for knowledge sharing and distribution in the field, as it has a multi-disciplinary perspective on mental, social, and behavioral sustainability. Psychological approaches are also important in the research field, with the second most productive journal, i.e., Frontiers

in Psychology, with 11 publications. Only 1 journal has published 6 articles, followed by Environmental Education Research and the International Journal of Sustainability in Higher Education, which have published five articles each. The other journals are made up of 3-4 publications each, such as the International Journal of Hospitality Management, Journal of Environmental Psychology, Information Technology, and BMC Psychology. The figure as a whole-shows that there are several journals in which publications are published, but Sustainability Switzerland is the main source of scientific knowledge, which means it places or promotes research on the topic.

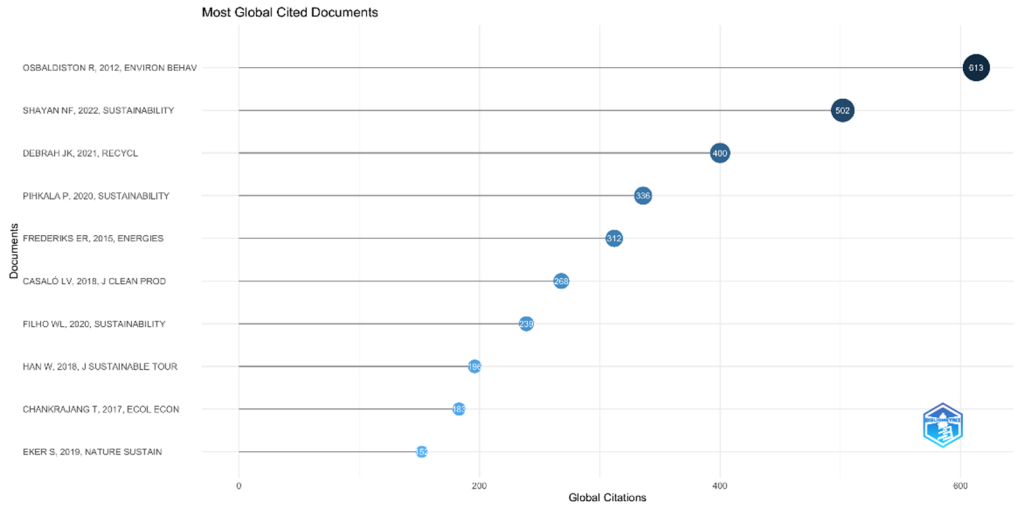


Figure 10. Global cited document

The most globally cited document emphasizes those publications that have garnered the most citations globally and hence form the intellectual backbone of the research field. The most influential publication is Osbaldiston et al. (2012), published in Environment and Behavior, with 613 citations worldwide. The second one is Shayan et al., (2022) in sustainability, with approximately 502 citations, which shows a remarkable influence despite being so recently published. Debrah et al. (2021) have been cited 400 times, and Pihkala (2020) has about 336 citations. Other popular and widely cited papers are by Frederiks et al (2015) with 312 citations. The figure shows that these publications have had a significant influence on the theoretical and empirical development of the field and continue to provide background references for their continued importance and impact on the field of science (figure10).

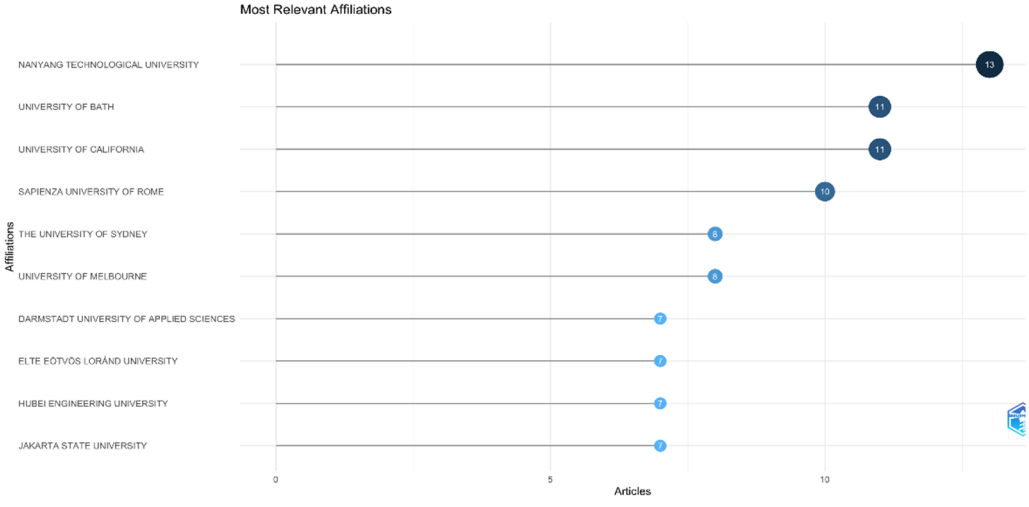


Figure 11. Most relevant affiliation

The most relevant affiliation figure shows which institutions are responsible for making the most publications related to research. Nanyang Technological University is the most prolific institution in the data set with 13 Publications. The University of Bath and the University of California are next with 11 publications each. The fourth is Sapienza University of Rome, with 10 publications, followed by the University of Sydney and the University of Melbourne, which both have 8 publications. There are 7 articles published by Darmstadt University of Applied Sciences, Eötvös Loránd University, Hubei Engineering University and Jakarta State University. The figure shows that leading research institutions are spread

across Asia, Europe, Australia, and North America, with a wide geographic distribution.



Figure 12. Word cloud

A word cloud is a graphic that displays the most common words in the body of literature selected, with the frequency of the word determined by the size of the word. The most prominent and important keyword is the term “sustainable development”, suggesting that it is the main theme of the research field. Other significant words are “human”, “sustainability”, “Behavioural research”, “psychology”, “climate change”, “male”, “female”, “adult” “human”, “perception” and “circular economy”. Demographic terms like male, female, and adult, human are common, indicating that many studies are carried out on human subjects and involved studies. The keyword shows that the field of research is interdisciplinary and covers the topic of Climate Change, environmental management, social responsibility, decision-making, leadership, mental health and organizational behavior. The overall word cloud shows that the psychological aspect of sustainable development is the dominant area of research interest, and that a wide range of issues are tackled within the interdisciplinary areas.

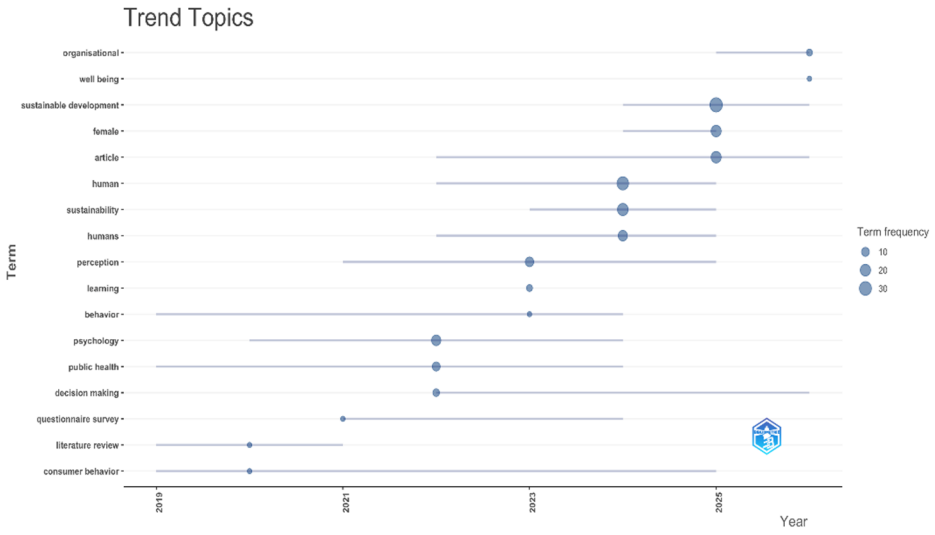


Figure 13. Trending Topics

The trending topics figure shows the evolution of research themes as it changes over time by plotting the number of times a keyword has been approached in the research and the median year in which it appeared. The horizontal line represents the length of time each topic has been represented in the literature, and the size of the circle indicates the number of times each term has been used in the literature. Research was generally more narrow in scope, focusing mainly on consumer behavior literature review and decision making, suggesting that the initial research in this space was understanding the behavioral determinants of sustainability more than through survey-based research. Psychological behavior and learning aspect, with an increase in interest in the cognitive mechanism under that sustainable action. Further human learning sustainability articles, female and organizational learning become more prominent in the most recent years (2023-2025), indicating that more recent research focuses on human behavior, demographic characteristics and organizational context

in relation to achieving sustainable development. The figure reflects the scope of studies from descriptive behavior-oriented to more multi-disciplinary studies incorporating elements of psychology education, public health, and ability.

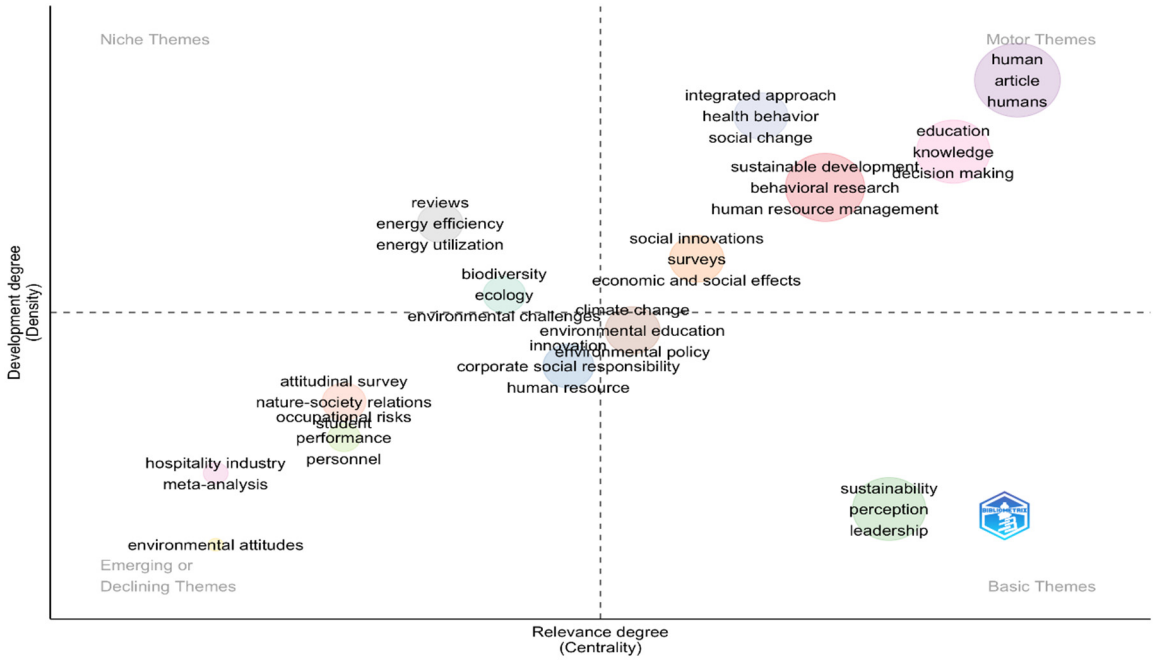


Figure 14. Thematic Map

The thematic map assigns a research theme to the two variables: Centrality, which is the importance of a theme in the research field, and density, which is the degree of development or maturity of a theme. There are four themes. The motor themes are clearly developed and important to the field and can be found in the upper right quadrant. This quadrant contains themes from psychology, human decision making, education, knowledge research, social behavior and environment management, which are currently reported to direct research in sustainable development. The upper left quadrant is dominated by Niche Themes (Health, Behavior, integrated approach, reviews) that are well developed but also more specialized and less related to the field of research in general. The basic theme is that the lower right quadrant is a fundamental theme that is central in the literature, yet continues to need theoretical and empirical development. Examples include sustainable development, perception, leadership and human behavior. Lastly, the lower-left quadrant shows emerging or declining themes such as environmental attitude, eco-tourism, hospitality industry and decision trees, which signify emerging or fading research interest in the topic map shows that the focus of the field is shifting to psychological processes that underlie sustainable behavior, while the field remains broad to include organization and environmental applications.

The conceptual of the proposal study that psychological capital directly enhances sustainable work behaviors (Balat & Bahşi, 2023). Moreover, the study highlights that high levels of psychological resources directly contribute to positive behaviors and performance outcomes (Balat & Bahşi, 2023). Psychological capital increases, demonstrating effort, which is a highly important predictor of performance (Luthans & Youssef, 2011). One pathway suggests that psychological resources enhance the ability to think holistically, which, in turn, facilitates behaviors aimed at long-term sustainability (Youssef-Morgan, 2014). Systems Thinking, as a complex, holistic perspective, enables employees to understand the long-term, multi-dimensional consequences of their actions, such as economic, social, and environmental (Luthans et al., 2007).

6. Discussion

The presented data on the number of scientific works published per year evidently demonstrate that the field under study has gone through a significant development stage turning from a marginal one into a new dynamic area of knowledge. Before 2014, the number of articles published per year was limited and unstable. While there was one article published in 2007, no works were published in 2008, 2009, and 2011. Starting from 2014, the situation began to change with a stable increase in the number of articles published per year: they numbered 3 in 2014, 3 in 2015, 4 in 2016, 6 in 2017, and 12 in 2018. It can be seen that the tendency to growth began in 2018 when the number of articles published hit double figures. It was followed by another increase to 11 articles in 2019. In 2020, the number of articles published rose to 15, and then to 24, 25, 35, 45, and 72 in 2021, 2022, 2023, 2024, and 2025 respectively. Thus, on average, 23.71% of scientific works on

the topic under study are published every year, with the total number of works amounting to 318 and coming from 223 different sources. Evidently, the declining number of published articles to 57 in 2026 does not demonstrate a tendency, as only 10 months of this year were covered by the dataset. Similarly, rising patterns of scholarly interest were observed in prior bibliometric analyses conducted in the realms of psychological capital and sustainability-themed research (Pham et al., 2024; Miah et al., 2025). Overall, the described trends demonstrate that the field represented by these data has matured significantly over the observed period turning from a niche of little interest into a major area of research.

The identification of the authors and their locations presented in the dataset can be used to infer certain characteristics about the field. First of all, the number of articles published by different authors suggests that the field is not dominated by only a few researchers; no particular author stands out in terms of the number of works published. Ten different authors have published three or more works in the field: Amel, Chiarella, Colombo, Fradin, Lefrançois, Manning, Raffone, Rajah, Reese, and Scott. Moreover, it should be noted that the field comprises a significant number of scholars who publish individually rather than collaborating with a large number of co-authors. In such a way, the graph demonstrates that the field is emerging and is not dominated by a small number of researchers, which is typical for new and multidisciplinary areas of knowledge (Pham et al., 2024). Secondly, it can be inferred that the field is international in nature because 34.91% of the 318 articles in the dataset list co-authors, with an average of 3.74 co-authors per article. The countries which contribute most to the field in terms of citation count are the United States (approximately 900), Australia (657), China (595), and Iran (588), followed by the United Kingdom (492), Germany (430), Portugal (410), Finland (338), Austria (258), and Spain (154). However, if the number of corresponding authors' locations is taken as a reference point, then China appears to be the most prolific contributor with approximately 32 papers, 22 of which are single-country authored and 10 are multi-country authored. The United States, followed by Australia and the United Kingdom, appear to be the second through the fourth most prolific contributors with 18, 15, and 14 corresponding-author papers, respectively. Thus, India, which accounts for approximately 12 corresponding-author articles, appears to be a significant contributor to the field, although its authors tend to publish fewer collaborative works. In conclusion, based on the analysis of authors' locations, it can be asserted that the field has global coverage, but its international involvement is uneven across countries; in particular, the authors in North America, Europe, and Australia dominate the field in terms of citation count, while China and India dominate in terms of corresponding-author papers. The authors' international distribution also reflects this tendency, underlining the topic's rising international recognition and relevance. Previous studies also report on the topic's growing international interest, with emphasis on the importance of cross-cultural understanding of sustainability-related phenomena (Zacher et al., 2023; Miah et al., 2025).

The bibliometric evidence concerning journal and institutional contribution indicates that this research area, while multidisciplinary in reach, is anchored predominantly around a small number of specialized outlets. Sustainability (Switzerland), for instance, is the journal that has attracted the most authors in the research field, with 33 out of 318 articles published in it. It had the highest source-level h-index of 14 among all journals, which is significantly higher than the index of other journals. Thus proving its popularity among researchers and its appeal to authors who are interested in publishing their work in both areas of study. The growing interest in journals such as Sustainability and Frontiers in Psychology signifies the multidisciplinary nature of the work, which incorporates readings from organizational psychology and sustainability and behavioral sciences (Zacher et al., 2023). Frontiers in Psychology was the next most common journal, with 11 articles published and an h-index of approximately 7. Three journals were unnamed; however, the number of articles published in each of them was six. Environmental Education Research and the International Journal of Sustainability in Higher Education had five articles published, and several journals, including the International Journal of Hospitality Management, the Journal of Environmental Psychology, and BMC Psychology, had three to four articles published. As for institutional publications, there is also a prevalence of a few universities. For instance, Nanyang Technological University published the most articles, amounting to 13. The University of Bath and the University of California were next in line with 11 articles each, and the Sapienza University of Rome came fourth with 10 articles published. The University of Sydney and the University of Melbourne each had eight articles published, while Darmstadt University of Applied Sciences, Eötvös Loránd University, Hubei Engineering University, and Jakarta State University each had seven articles published. Overall, it can be stated that the research field is international in nature, attracting papers from authors affiliated with universities both in Asia and Europe and Oceania. Similar patterns of institutional concentration have been found in previous bibliometric research, which has revealed the disproportionate role played by a small number of universities and journals in the development of new fields of inquiry (Pham et al., 2024; Miah et al., 2025). Thus, although the majority of the research articles are concentrated in several journals, those journals are international in nature and not specifically focused on either environmental or behavioral studies.

The findings from keyword data analysis are also informative in terms of delineating the conceptual space where this literature resides as well as the direction in which this field has moved during the timeframe covered by the search. According to word cloud analysis, the term 'sustainable development', far by the lead, dominates the keyword list, followed by a group of terms

closely related to it: sustainability, human, behavioral research, psychology, climate change, and circular economy. Notably, the dataset includes a number of keywords indicative of the type of research subjects addressed in the selected literature, such as male, female, and adult. Furthermore, terms associated with environmental management, social responsibility, decision-making, leadership, and organizational behavior also appear in the list. This suggests that the analyzed literature addresses a range of themes concerned with the role of human factors in environmental and organizational contexts rather than being confined to a particular field. The statement aligns with modern views on organizational psychology, which acknowledge that sustainability is a complex concept encompassing individual, organizational, and societal aspects (Zacher et al., 2023). The trend analysis also offers valuable insights; it highlights the fact that, towards the beginning of the timeframe, the focus of research appeared to be primarily on consumer behavior and decision-making processes. As time went by, the thematic focus gradually shifted towards psychology-related aspects of sustainable development. The rise in popularity of psychological and organizational constructs in the literature mentioned above contributes to the increasing importance of positive psychological resources and systems thinking for tackling sustainability issues (Luthans & Youssef-Morgan, 2017; Wiek et al., 2011). In particular, terms related to human and organizational learning and such demographic categories as female started to populate the keyword list more frequently, especially in the most recent studies (2023 - 2025). Overall, the changes in trends demonstrate that the literature on sustainable development and behavioural research has evolved from being descriptive and focused on processes to becoming increasingly concerned with psychological and organizational aspects of the subject matter.

The thematic strategic map presenting aggregated research themes in terms of their centrality (importance for the field) and density (the level of developed theory and practice) allows for a more comprehensive understanding of the relative maturity of different areas explored in the body of literature on sustainable development. The Motor theme quadrant, the one featuring themes with a high centrality and density, includes psychology, human decision-making, education, knowledge research area, social behavior, and environmental management. This suggests that these themes are the most influential ones, shaping other areas of research on sustainable development. The prevalence of psychological and people-oriented motives within the motor themes underscores the growing interest in human-centered initiatives in sustainability scholarship, which has been a key trend in management and behavior studies during the last years of research (Zacher et al., 2023). The Basic quadrant, representing themes with moderate centrality and density, contains such areas as sustainable development, human perception, leadership, and human behavior, meaning that they are important for the field but require more development than the motor themes. In turn, the Niche quadrant encompasses themes with a low centrality but a moderate density, namely health, behavior, and integrated approaches, while the declining quadrant includes environmental attitude, eco-tourism, hospitality, and decision trees. Overall, the strategic map suggests that despite their centrality and density, most themes in the literature on sustainable development are not fully developed, with the terms leadership and human behavior, for example, being deemed underdeveloped. This has direct implications for the current research, as it suggests that if such prominent concepts as psychological capital and systems thinking are not found in the list of themes, they potentially occupy a much lower level of centrality and maturity than most of the concepts traditionally used in the studies of sustainable development. This finding is significant because it suggests the need for future studies investigating the role of Psychological Capital and Systems Thinking in sustainability contexts. Indeed, Psychological Capital has been widely recognized as an important construct in organizational contexts (Luthans & Youssef-Morgan, 2017). Similarly, Systems Thinking is considered one of the critical competencies for sustainability (Wiek et al., 2011). Thus, the lack of emphasis on these two areas in the reviewed literature was notable.

Overall, upon consideration of the data presented by the analyzed articles, it is possible to suggest that the research area covered by them has seen a significant increase in interest over time, which is projected to continue in the future. Similar patterns of growth in terms of number of publications were observed in more recent bibliometric studies devoted to psychological capital and sustainability-related topics, both of which can be expected to attract significant attention in the years to come (Pham et al., 2024; Miah et al., 2025). However, it appears that the scope of the field is not entirely covered by the considered topics. Even as of the year 2021, the number of articles published per year is relatively low (24 articles published per year). Despite the significant increase after 2020, for most other topics covered by this study, the number of publications is lower on average compared to the trend of the overall scope of research, which implies that there is room for further research in the areas presented by the analyzed articles. This includes, in particular, the topic covered by this research, which serves as a foundation for multiple suggested areas of future research. In particular, the relative lack of interest in psychological capital and systems thinking in the sustainability literature is noteworthy and deserving of further consideration given their potential relevance to organizational and sustainability contexts (Luthans & Youssef-Morgan, 2017; Wiek et al., 2011). While the identified keywords and themes covered by the reviewed articles offer a solid basis for further study, the relatively low level of research in some of the suggested areas indicates potential research questions that could be pursued in the future. It is important to note, however, that due to the nature of this bibliometric study, the data it provides is limited by the methodology used to extract it. The scope of this study is limited to the available literature, which in turn constrains the possibility to analyze more specific or detailed aspects of the analyzed field. The choice of keywords potentially limits the data to only those articles that include those terms, and the timeframe considered by the study may not be comprehensive enough to capture all relevant articles published prior to

its publication or using alternative keywords. Furthermore, the identification of neglected topics and emerging terms may help the researchers to identify future perspectives for investigation and, at the same time, contribute to the development of interdisciplinary sustainability studies (Zacher et al., 2023).

However, based on the data presented by this bibliometric study, the trends in publication counts, authorship, affiliation, and keywords, can serve as a useful foundation for further research. Specifically, the areas identified by the study as having lower research attention and the specific themes and terms suggested by the study can be considered when determining potential research questions and directions for future research.

7. Conclusion

The presented bibliometric analysis revealed that the relationship between psychological capital, systems thinking, and sustainable work behavior falls within a diverse range of topics that combine Organizational psychology, sustainability research areas, and management studies. Within this field of study, the number of works published has increased from 2007 to the present moment, demonstrating a significant surge in interest over the last five years, reaching 72 articles in 2025 and an annual growth of 23.71%. The majority of the 318 publications were released in 2025, followed by 2024. The number of authors was moderately distributed among the 223 sources, while the most cited countries were the United States, Australia, China, and Iran. Sustainability (Switzerland) was the most common source, and Asia, Europe, Australia, and Americas – the regions where works were published. The last observation was also found to be relevant to the study's topic since, based on the analysis, an increase in studies exploring human factors rather than consumer psychology was observed over the years, including human learning and Organizational contexts. Despite the growing interest in the field, the relationship between the three components, particularly sustainable work behaviour, has not been extensively studied. Indeed, no mention of the concept of systems thinking as a separate key theme, keyword, or cluster was found in the topic analysis. A similar omission of this concept was found in the two bibliometric analyses referenced by the current study (Pham et al., 2024; Miah et al., 2025), as well as the absence of this theme in 2021, when only 24 articles were published within this research area. The findings of this study can be used in future research since the current theme has the potential to develop further within the discussed area. Moreover, the lack of systems thinking as a key theme indicates possible directions for further research, including an empirical study of the connections between the three components within the working environment of a commercial bank. Indeed, in the context of employees' wellbeing and environmental sustainability, their learning and awareness are vital to developing responsible work styles that would promote Organizational sustainability. Therefore, future research should be conducted to explore the connections between these three themes, and the current bibliometric analysis can serve as a starting point for this study.

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Author contributions

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