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**Research Article**

# A Scientometric Review on Visualization Analysis of Global Research Trends in Metacognition and Self-Concept

**V. Banu Priya[1*], N. Savitha[2]**

[1]Research scholar, Department of Social Sciences, School of Social Sciences and Languages, Vellore Institute of Technology, Vellore, India
*** Corresponding Author Email:** banupriyavenkat19@gmail.com - **ORCID:** 0009-0005-5267-6429

[2]Associate Professor, Department of Social Sciences, School of Social Sciences and Languages, Vellore Institute of Technology, Vellore, India
**Email:** savitha.n@vit.ac.in - **ORCID:** 0000-0001-9374-4014

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**Abstract:**

In recent years, significant advancements in cognitive performance through metacognition have been observed, with self-esteem positively impacting individuals' lives and subjective well-being. This has led researchers to conduct comprehensive studies across metacognition, psychology, neuroscience, and related fields. As comprehension metacognition advances, there is a growing consensus that academics require interdisciplinary approaches. This work uses the Biblioshiny package in R to do a scientometric review of the global research landscape concerning metacognition and self, forecasts its future trajectory, and offers references for pertinent domestic research from global source journals. The findings demonstrate that spearheaded by the USA, the United Kingdom, Italy, and other nations, international metacognition research has established a comprehensive framework, encompassing a "descriptive analysis of cognitive development" and a "practical investigation of metacognitive belief intervention." In the future, while emphasising these two research categories, the empathetic capabilities of individuals may be considered to enhance metacognitive beliefs and the overall wealth of life.

## 1. Introduction

The observation of one's own cognitive capacity or thinking processes plays a major role in human cognition and influences how an individual controls, monitors and regulates their mental process. Zhuang et al. idea of metacognition comprises two fundamental components [1]: metacognitive knowledge which is awareness of one's own and other's cognitive processes and metacognitive experiences which state that conscious cognitive or emotional states accompany present behaviour [2]. His primary theoretical contribution was established to investigate and influence learning and academic achievement.

To regulate one's self in the learning and decision-making stages, an individual's capacity to analyse and monitor their mental process is crucial. Self-concept, which includes how one sees oneself, their skills, traits, and overall sense of self, plays an important role in this regulation [3]. Understanding one's cognitive capabilities and limitations helps from a realistic self-concept, which in turn impacts motivation, sense of competence, and actions when faced with learning and decision-making challenges. Metacognitive processes are fundamental to self-concept because they allow individuals to control their actions, and reflect on and evaluate themself, thereby shaping their self-perception [4].

An inability to appropriately assess one's performance can significantly impact performance evaluations and control decisions in the learning process [5]. Adapting the decision-making process by engaging with metacognition involves individuals reflecting on and improving their cognitive abilities. This, in turn increases resilience and motivation, enhancing the likelihood that people will construct positive self-concept and achieve accurate self-evaluation [6].

A strong robust link between metacognitive abilities and the formation of self-concept has been

demonstrated in previous studies. Schraw & Moshman believe that people with robust metacognitive skills are more effective at their learning stages, resulting in a clearer comprehension of their strengths and deficiencies [7]. However, those who lack metacognitive skills have a hard time recognising their shortcomings, leading to an inaccurate self-view that hinders their growth and success [8]. In the workplace, career advancement depends on self-evaluation, leadership roles, and problem-solving abilities [9]. Given the intricacy and multifaceted nature, examining how self-concept influences metacognitive abilities is essential.

Through a bibliometric analysis Kraus et al., [10], the study aimed to provide a comprehensive overview and in-depth review of the current status and perceptive evolution in the domain of metacognition and self-concept investigation. This analysis is designed to help researchers elucidate and delineate research gaps accurately. By interpreting and mapping the nuanced distinctions in scientific knowledge the study quantitatively examines the accumulation and evolution between metacognition and self-concept analysis [11]. Additionally, the researchers encourage scholars to bridge the gap between theoretical understanding and real-world problems, particularly to assist individuals with thinking disabilities in improving their language skills and overall quality of life.

This research utilizes publications from the major collection of the Scopus database, focussing on studies related to metacognition ability published in international journals from 1994 to 2024. By employing the author's keyword, theme distribution map, and theme evolution map, a thorough comprehension of the field's core topics, its evolution process, and its progress trend can be achieved from both coordinated and diachronic viewpoints. To identify the dominant paradigms and schools of thought in this area, VOSviewer is used to visualize the networks collaboration between nations and authors. By examining the role of the developing field, scholars can gain a better understanding of the supporting literature that has shaped this area.

The subsequent sections of this paper are organised as follows: The second section provides an overview of the research methodology, the third section presents results of bibliometric variables, and the final section discusses the implications for further research.

## 2. Methodology

RStudio serves as the basis for the open-source web visualisation application called Biblioshiny. It has numerous advantages in literary analysis, statistical evaluation, index calculation, network analysis, and knowledge mapping. The systematic and quantitative analysis of literary data will facilitate the understanding of the evolution of specific fields, derive insights from historical and contemporary knowledge bases, uncover recurring themes, predict future trends, and enhance the research trajectory. Consequently, the R package "bibliometrix" was utilised to do this review study. The keywords "metacognition" and "self-concept" were identified as the leading terms in the Scopus database. Data mining was conducted from the Scopus database on August 22, 2024, employing the subsequent search query. The phrases "metacognition" and "self-concept" are utilised as retrieval criteria, employing the "Scopus categories" as a filter. In the preliminary stage, two rules/topics will be established for data collection: the terms "metacognition," "metacognitive", "self", "concept," and "self-concept" will be utilised as search terms. Utilise the Scopus database to search for "Article title, Abstract, Keywords" employing the conjunction of keywords (Rule 1 AND Rule 2), thereafter inputting them into the search box for each topic. The search was conducted using the "limit to" document type, specifically targeting articles and reviews. The publication year was designated as "All Years," while the access type was classified as "All," encompassing open access. A total of 578 articles comprised the preliminary enquiries. We want to thoroughly address all facets of technical progress in Metacognition and Self-concept. Upon designating "Article" as the document type and "English" as the language, the authors searched within the fields of Psychology, Social Science, Arts and Humanities, Neuroscience, Decision Science, and Multidisciplinary studies. A total of 433 publications were identified in these categories. Table 1 offers a succinct summary of the initial three phases. This investigation employed bibliometrix and VOSviewer.

## 3. Research Questions

**Bibliometric Analysis**

RQ 1: what is the current state of research on metacognition and self-concept as indicated by scientific publications in this domain?

RQ 2: which research disciplines study metacognition and self-concept? Signifies level of cooperation?

RQ 3: what are the current growth patterns and next directions for studies on metacognition and self-concept?

***Table 1.*** *Search Strategy's flow diagram designed with Scopus Database; Source.*

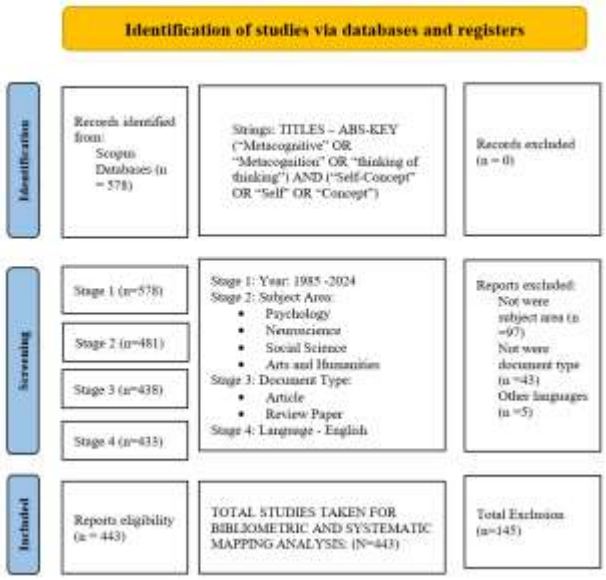


***Table. 2*** *Major Information Regarding Data.*

| **Description** | **Outcomes** |
|---|---|
| Period | 1985:2024 |
| Sources (Journals, Books) | 232 |
| Documents | 433 |
| Annual Growth Rate (%) | 9.38 |
| Document Average Age | 8.95 |
| Average citations per doc | 39.79 |
| References | 22912 |
| **Contents of Documents** | |
| Keywords Plus (ID) | 2089 |
| Author's Keywords (DE) | 1127 |
| **Authors** | |
| Authors | 1323 |
| Authors of single-authored docs | 39 |
| Authors Collaboration | |
| Single-authored docs | 44 |
| Co-Authors per Doc | 3.82 |
| International co-authorships (%) | 28.87 |
| **Document Types** | |
| Article | 389 |
| Review | 44 |

## 4. Results

### 4.3 Performance and Citation Analysis

Characterised by its descriptive nature, performance analysis is regarded as a defining feature of bibliometric studies [12]. The majority of review articles are composed of this, as it fulfils specific analytical objectives by focusing on the contributions that research offers to a particular topic, while also serving as a backdrop or profile in empirical studies [11]. Table 2 presents the key details of 433 documents published from 1985 to August 2024, sourced from the Scopus database, across 232 different publications, predominantly journals. The core concepts identified by the author are referred to as the "Author's keywords," and there was a total of 389 articles. The term "keywords plus" refers to the total amount of keywords, which is 2089, commonly displayed in article titles. Between 1985 and 2024, one author completed and published 53 articles in total, while the majority were authored by three individuals, averaging 3.82% publications each. The percentage of international co-authorships stands at 28.87%, indicating that research on "metacognition" and "self-concept" is often conducted by a larger number of scholars. This phenomenon is prevalent as it encompasses multiple fields, such as sociology, psychology, medicine, social sciences and humanities, necessitating the involvement of experts from diverse academic backgrounds. The annual academic production of research publications focused on the self-concept of metacognition provides a comprehensive analysis of the evolution, advancements, and current trends in this particular domain. Figure 1 shows the total number of articles generated between 1985 and 2024. The prevalence of metacognition has consistently increased throughout time. In 2015, 28 publications were issued that examined the extent to which metacognition is manifested as a consequence of self-concept. There were 38 scholarly publications published in 2020, which may have been caused by an unexpected surge in articles following the COVID-19 epidemic. The representation below illustrates the improved visibility and clarity of metacognition studies during the study period.

Table 3 indicates which of these journals publish pertinent papers. The utmost related sources, allow researchers to rapidly understand the various methods of connected research as well as trends in its development. The ten most relevant journals in Table 3 can be classified into three categories based on the topics of the published papers. Metacognition, as the initial category, has provided 26 publications during the previous sixteen years. Journal of Psychiatric Research, Cortex and Schizophrenia Research. The main explanation for this notable distinction is that Metacognition is a psychiatric journal specialising in comprehensive cognition research. The second category is exemplified by the Journal of Consciousness and Cognition, Cognitive Neuropsychiatry which concentrated on the research on the clinical and cognition aspects. Most of the publications are interdisciplinary and encompass a broad spectrum. Consequently, this category contains the main number of citations yet the quantity of each journal publishes fairly is rather low. Table 3 has ten journals in this category, comprising a total of 20 articles that represent the

***Table 3.*** *sources include "metacognition" and "self-concept".*

| Source | No.of.items | No.of.citation |
|---|---|---|
| Psychiatry Research | 13 | 364 |
| Consciousness and Cognition | 12 | 899 |
| Plos One | 12 | 163 |
| Behavioral and Brain Sciences | 11 | 680 |
| Cognitive Neuropsychiatry | 8 | 119 |
| Cortex | 7 | 71 |
| Journal of Personality and Social Psychology | 6 | 796 |
| Schizophrenia Research | 6 | 335 |
| Behaviour Research and Therapy | 5 | 335 |
| Behavioural and Cognitive Psychotherapy | 5 | 115 |

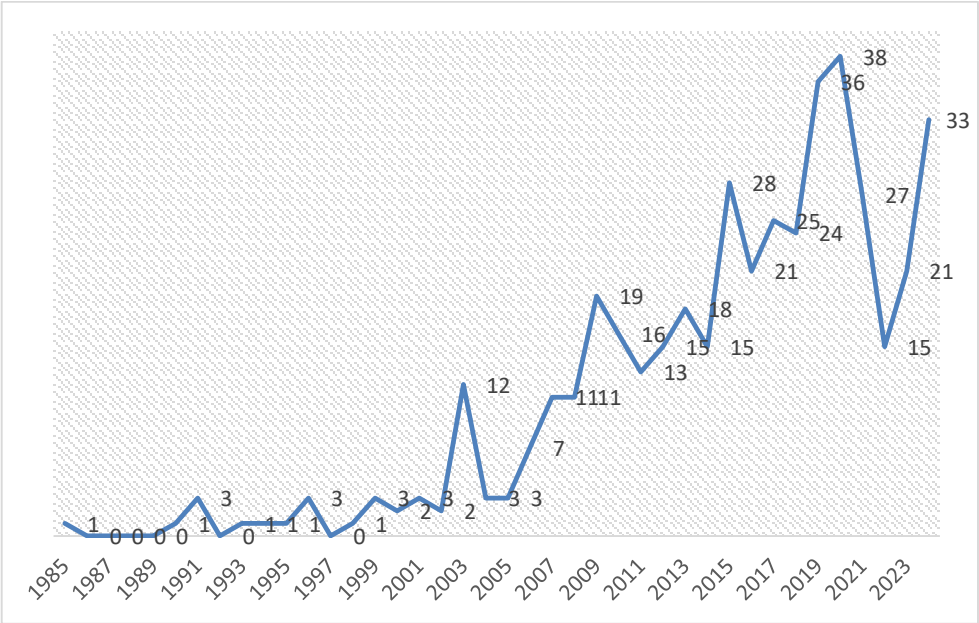


***Figure. 1.*** *Annual scientific production.*

overall publications. The third category, comprising Behaviour Research and Therapy, Behavioral and Brain Sciences, and Behavioural and Cognitive Psychotherapy mostly focuses on research related to metacognition and self-concept, with just 39 articles representing the total publications. Some researchers have observed the personality issues of individuals with metacognition and self-concept, prompting relevant research.A pattern emerging in the frequency of journal papers research on "metacognition" and "self-concept" from 1985 to 2024 is illustrated by the curve on the source growth Fig. 2. more articles published in psychiatry research than any other journal focus on metacognition. Other publications, including Behavioral and Brain Science Cognitive Neuropsychiatry, Consciousness and Cognition, and the Plos one, have also consistently increased. The examination of metacognition is a highly advantageous subject in global publishing. According to the number of

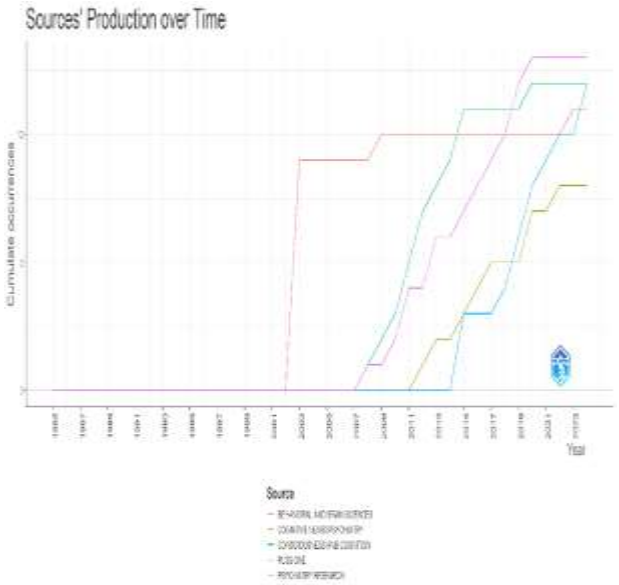


***Figure. 2.*** *Sources' production growth.*

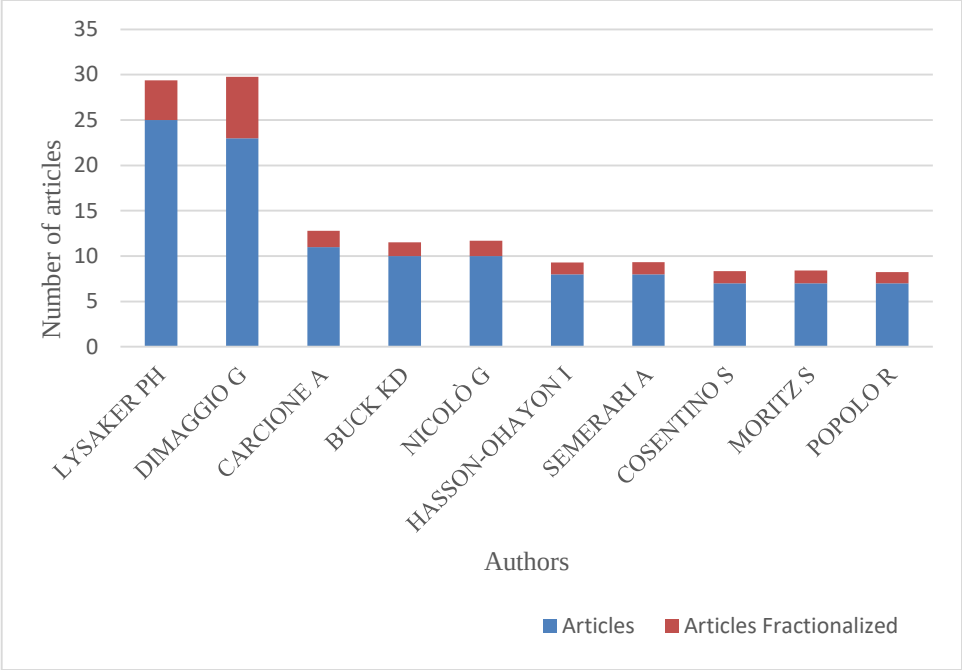


***Figure. 3.*** *The productivity of the author.*

publications dealing with "metacognition" and "self-concept" the top ten authors are shown in Fig.3. The most productive author according to, Lysaker PH has 25 papers, making them the most productive author. Comes in second Dimaggio G, with 23 papers. Carcione A has 11, and Buck KD and Nicolo G each have 10. Hasson-Ohayon I and Semerari A each have 8, and Cosentino S, Moritz S and Popolo R collectively have 12. The number of fractionalized articles, as well as the most productive authors, are listed in Fig. 3.

### 4.2 Analysis of Citation

Citations analysis is a fundamental method for science mapping that reveals the influences of notable sources, sources and documents inside an academic discipline, as evidenced by several metrics including the most cited authors, documents, references and sources.

Figure 4 presents a detailed analysis of the top ten authors based on their output metrics. This analysis will focus on the most cited authors to illustrate the most influential figures in the field of metacognition. Furthermore, frequent source citations that were previously examined in Table 4, will be excluded from the citation analysis. Instead, I will focus on the most local cited references to highlight the fundamental literature in metacognition and self-concept research. An author's h-index is the sum of all the works by the authors that have been mentioned at least h times by other authors [13]. Additionally, various indicates, including the h-index, g-index, and m-index, provide a quantitative assessment of the author's impact [14]. Among articles ordered by citation count, the g-index is the highest value at which the top g articles are referenced at least g2 times [15]. The m-index is calculated as the author's h-index divided by the number of years since their first population, where h is the h-index of the authors. Alonso et al., indicate that the m-index is computed as h/n, where n is the number of years from the author's first publication and h is their h-index [16].

The researcher narrowed our focus to 433 articles that have been analysed and now they have shaped the field of studies on metacognition and self-concept, rather than the 22912 references listed in the bibliography, so that can more easily and accurately understand the basic work that researchers in related and allied fields have laid for future research. It is important to be aware that citation analysis allows for the examination of references from both a global and local perspective. The globally cited references encompass all citations from any publication, whereas the local cited references are defined as internal citations within the analysed sample [17]. Wells A., "Emotional Disorders and Metacognition: Innovative Cognitive Therapy", published in 2000, [18] is among the most cited references, with 19 citations. The most frequently cited author across all three indices, Table 4 whose first-authored article, "Metacognition Amidst Narratives of Self & Illness in Schizophrenia: Associations with Neurocognition, Symptoms, Insight and Quality of Life," published in Acta Psychiatrica Scandinavica in 2005, ranks among the most locally cited

***Table 4.*** *Most cited authors.*

| Most cited authors | | | | |
|---|---|---|---|---|
| **Element** | **h_index** | **g_index** | **m_index** | **TC** |
| Lysaker PH | 19 | 25 | 1.056 | 1539 |
| Dimaggio G | 18 | 23 | 0.9 | 1388 |
| Carcione A | 11 | 11 | 0.55 | 994 |
| Buck KD | 10 | 10 | 0.588 | 736 |
| Nicolò G | 10 | 10 | 0.5 | 894 |
| Hasson-Ohayon I | 8 | 8 | 0.667 | 272 |
| Semerari A | 8 | 8 | 0.4 | 575 |
| Moritz S | 7 | 7 | 0.778 | 212 |
| Popolo R | 7 | 7 | 0.389 | 319 |
| Cosentino S | 6 | 7 | 0.429 | 208 |

***Table 5****. Majority of local references cited.*

| Majority of local references cited | |
|---|---|
| **References cited (Primary author, source and year)** | **Citations** |
| "Wells A., 2000, Emotional Disorders and Metacognition: Innovative Cognitive Therapy" [18] | 19 |
| "Bandura A., 1997, Self-Efficacy: The Exercise of Control" [19] | 16 |
| "Fleming S.M., 2010, Relating introspective accuracy to individual differences in brain structure, science, 329" [20] | 15 |
| "Cohen J.,1988 Statistical Power Analysis for The Behavioral Sciences" [21] | 12 |
| "Frith C.D., 2012, The Cognitive Neuropsychology of Schizophrenia" [22] | 12 |
| "Wells A., 2009, Metacognitive Therapy for Anxiety and Depression" [23] | 12 |
| "Dunlosky J., 2009, Metacognition" [24] | 11 |
| "Flavell J.H., [2] | 11 |
| "LYSAKER P.H.,2005, Metacognition Amidst Narratives of Self & Illness in Schizophrenia: Associations with Neurocognition, Symptoms, Insight and Quality of Life, Acta Psychiatrica Scandinavica, 112, 1" [25] | 8 |

references with eight citations. Examining the ten most often mentioned local sources, we find a strong basis for future research. Wells [18] discusses the shortcomings of cognitive models and explains how emotional susceptibility, the maintenance of stress reactions associated with trauma, and emotional illnesses are all influenced by metacognition, self-attentional processes, and worry/rumination techniques, to help the clinician adopt a new cognitive approach to altering negative ideas, erroneous beliefs, and distressing emotions, the author thoroughly explains new treatment procedures using the metacognitive paradigm [18]. Bandura [19] concept explained that self-efficacy is believed to exert a causal effect on outcome expectancy, especially when there is a strong correlation between the execution of the action (e.g., winning a tennis match) and the possible results of that behaviour. Fleming et al. [20] in their study an introspection of self-performance is fundamental to human subjective experiences. Isolated variances in introspective capacity from objective performance in a basic perceptual decision test, enabling us to ascertain if the inter-individual variability correlated with a specific brain structure. Interaction between the prefrontal cortex and other brain regions, particularly the temporal cortex, is essential for the formation of conscious content [26]. Lysaker et al. [25] found that comprehension of one's mind is associated with enhanced neurocognition across various domains and reduced emotional disengagement. Improved verbal memory and reduced emotional disengagement were associated with higher levels of empathy. Enhanced metacognition during international problem-solving correlated with improved verbal memory, insight, and social functioning, alongside less emotional withdrawal and paranoia. Above the research then transitioned to applications involving the continuous and comprehensive integration of multiple disciplines. The increasing number of clinicians has led to the incorporation of language learning to enhance metacognitive skills and self-regulation as a means to increase well-being and intervention efficacy.

### 4.3 Analysis of Social Structure

Table 1 (Collaboration Index and Co-Authors per Document) and the fractionalised frequency suggest that studies focussing on "metacognition" and "self-concept" are mostly team efforts. Fig. 4. Also indicate this. The collaborative team is organised into ten clusters, each representing one of ten hues.

This shows that some writers weave in and out of one another Dimaggio, Giancarlo, collaborates with more people than most. Moreover, almost fifty percent of the notable authors originate from the USA. Team members and other experts from other disciplines worked together in a comprehensive interdisciplinary effort to study metacognitive development. Working together, fields like cognitive science, psychology, and linguistics were able to merge. Research conducted by relevant universities, and rehabilitation centres in several professional sectors provides strong evidence of the tight integration of language and condition. This research ensured the viability and future viability of the field as a whole.

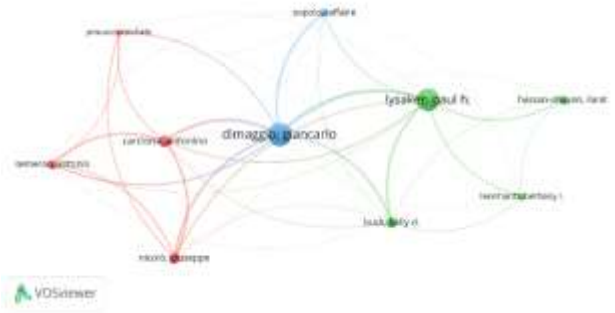


*Figure. 4. The author's collaborative network.*

The rising prevalence of individuals with self-concept and focus on the metacognitive abilities related to personal identity are significant global issues. The dimensions of each node often signify a nation's significance and contribution to the collaborative network. VOS viewer was employed to simplify visualization of the international collaboration network, resulting in Figure 4, where nodes symbolize countries, linkages denote countries and linkages denote their cooperative relationships. Moor et al. [27] the thickness of the linkages signifies the level or frequency of collaboration across nations. The country partnerships network map depicts the current state of global cooperation and the distribution of research institutions in this field, providing more precise monitoring of research boundaries.

Figure 5, shows that the United States, the United Kingdom and Germany have been the foremost contributors to metacognitive research over the years. Alongside international collaborations, they have each independently led the publication of 88, 25, and 20 papers respectively. Additionally, three international collaborating groups have formed with these three countries at their core: USA – Australia - Italy, UK – France - Italy - Brazil, and Australia - UK – Greece - Singapore – Hungary – Canada has also attained numerous achievements in this domain and established a very steady cooperative consortium.

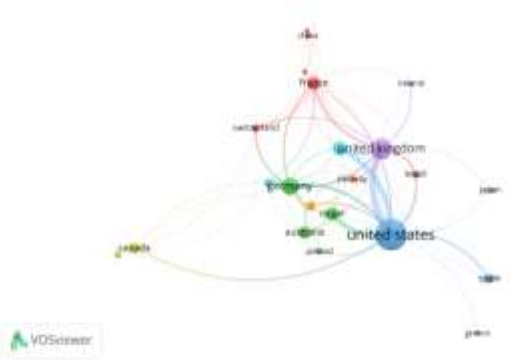


***Figure 5.*** *Graphic representation of an international collaboration network among nations.*

### 4.4 Analysis of the Conceptual Structure

In Figure 6, the keywords are designated as "author's keyword", and the top 50 keywords were automatically enumerated based on their frequencies (cube sizes). The analysis indicates that the leading 50 terms, along with their frequency rates, are as follows: "metacognition" (n=239,33%), "Schizophrenia" (n = 37, 5%), "Self-awareness" (n = 23, 3%), "confidence" (n = 22, 3%), "psychosis" (n=17, 2%), "awareness" (n=16, 2%), and "cognition" (n=15, 2%). The keywords that appear frequently may reveal particular features of the research. Upon closer examination of Figure 6, we may briefly delineate the principal characteristics of metacognitive research in recent years, as follows: (1) concentrate on the interplay between metacognitive knowledge and language; (2) Emphasise metacognitive methods including self-awareness and confidence; (3) The research methods predominantly encompassed quantitative and qualitative approaches, including discourse analysis. The topic dendrogram in Figure 7 aims to illustrate the ordered structure and relationships among the author's keywords and topic progression identified using hierarchical clustering. Each item constitutes a collection of keywords about "metacognition" and

***Figure 6.*** *The graphic representation of an author's keyword in "metacognition" and "self-concept".*

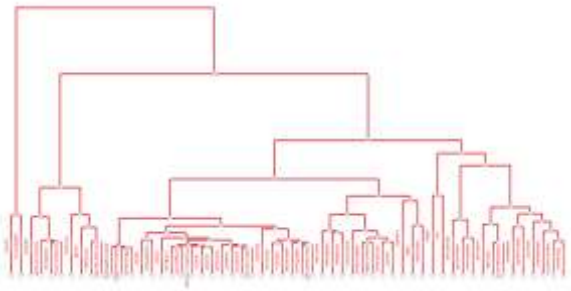

***Figure 7.*** *Dendrogram of topic.*

"self-concept". The below graph illustrates that research in the domain of metacognition comprises a singular category. The focus of the strand is mostly on the assessment of metacognition. The initial strand has been subdivided into two segments. One segment pertains to individuals' awareness of metacognition, including metamemory and metacognitive belief. Participants in metacognitive awareness interventions may enhance their quality of life. In the second portion, metacognition can integrate into the monitoring process primarily through cognitive aspects and self-esteem; in the subsequent strand, the primary study focus encompasses progressive self-concept, self-esteem, social cognition, executive function, and their interrelations with psychotherapy.

Figure 8 illustrates that scientists seeking to deepen their understanding of this topic can trace its origins and developmental trajectory. A thematic progression map, and it is Figure 8, is constructed using the "Author's keyword" as a criterion.

There have been two distinct epochs in the history of metacognitive research: the first, from 1985 to 2017, and the second from 2018 to 2024. The initial stage comprised four themes with varying numbers of topics utilised. "Metacognition" preceded "self-regulation" and "mindfulness". The second research phase involves integrating and enhancing the initial phase, which possesses greater predictive value. Themes in the second stage indicate that qualitative methods, particularly metacognitive approaches, have been employed as a primary means to investigate the discourse surrounding self-concept strategies utilised in interactions. Concurrently enhancing intervention strategies to elevate quality of life is also notable.

The thematic map comprises quadrants of four delineated by two criteria: significance and level of development. Figure 9 shows that the theme map serves as a conceptual framework utilising "author's keyword" as the variable illustrating the current state of topic groups in the domains of "metacognition" and "self-concept", along with the interrelations inside and among these groups. Themes in the first querent exhibit significant importance and

***Figure 8.*** *Evolution of thematic.*

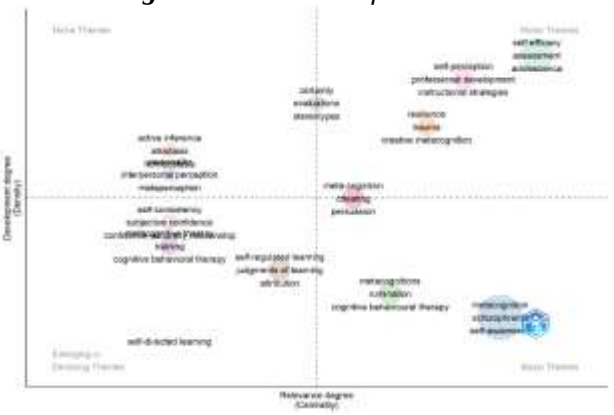

***Figure 9.*** *The Thematic map.*

development characterised by robust momentum and a mature system, referred to as the mainstream theme (theme of the motor). Motor themes are advanced themes within the discipline and are crucial for structuring the study subject. Self-efficacy constitutes a variant self-concept. Numerous scholars investigate the self-concept, which is crucial for self-assessment, psychological well-being, and affirmation of one's identity [28]. Furthermore, various studies in educational psychology have aimed to examine the impact of self-concept and efficacy on the enhancement of cognitive ability [29]. The themes of the next quadrant exhibit a greater level of development and a diminished level of relevance, signifying that the momentum of development is superior although not closely aligned with prevailing research in the current domain. These themes pertain to a specialised specialisation. According to Figure. 9, themes including metacognitive therapy, cognitive behavioural therapy, learning and self-consistency all are related to the psychological state. It explains that some researchers begin to pay attention to self-concept with cognitive attribution [30]. Simulation theory investigates whether self-oriented and other-oriented talents are identical, depending on a singular cognitive process. Signal detection theory posits that confidence in a judgement is solely based on the imprecision of that decision, forecasting a strong link between decision accuracy and confidence [31].

Centrality and density both are low in the third quadrant, indicating the developmental immaturity and the absence of a robust primary theme. The

theme in this quadrant will either be emerging or waning. The inadequacy of executive functions or a developmental lag in metacognitive functions may lead to these diminished levels. Limited metacognitive awareness may adversely impact emotional resilience by engendering maladaptive beliefs and coping mechanisms [32].

The fourth quadrant possesses significant relevance yet exhibits less development, categorising it as a fundamental topic that typically establishes the groundwork for comprehending a specific domain. As shown in Figure 9, the fundamental themes include "self-awareness", "rumination" and "metacognition". These could be controlled by psychological well-being. Comprehension of the other's cognition and mastery of abilities enhanced over time, regarding the correlation between metacognitive functioning and the therapeutic relationship [33].

## 5. Conclusion and Discussion

This study conducted a visual analysis of 433 publications concerning metacognition and self-concept in Scopus, utilising bibliometrics within the Rstudio environment. Findings indicate 1. A rising trend in global research on metacognition in recent years, predominantly within the field of humanities, rehabilitation and social sciences; 2. There is a well-established research system and paradigm in this field, with descriptive studies focussing on learning and intervention complementing each other. 3. The USA, Australia, the UK, and Italy, among other countries have formed a cooperative institution. 4. Research focal points including "self-awareness", "mindfulness" "cognition" and "rumination". 5. There is a well-established research system and paradigm in this field, with descriptive studies focussing on well-being and metacognitive knowledge professional development regarding adults [34]. Individuals with cognition recognise the significance of interaction with each other, thus requiring engagement in social activity and the foundation of social encounters.

Individual growth has the potential to enhance people's distressed mental health and wellbeing. Personal growth is essential as individuals will significantly contribute to social advancement. This study has examined more than 40 years of research publications that have stated various dimensions and transformations over time. This research keeps tackling the most important problems in attaining cognitive and self-awareness depending on this information. Enhancing this research necessitates addressing contemporary issues and their resolutions.

Future studies should prioritise enhancing the intervention-based application of metacognitive beliefs. In social interactions, self-concept assumes the role of requiring acknowledgement of learning and seeking comprehension of others. Cognitive behavioural therapy of metacognition prioritises real-life experiences and social engagement [22]. Group therapies, as a modality of cognitive-based intervention, serve as an impactful avenue for persons with low self-esteem to exchange their experiences and perspectives with peers in a relaxed and supportive setting, thus encouraging contact and engagement among individuals [35].

Moreover, mental health practitioners can build rapport with individuals and effectively convey information through the use of self-esteem strategies and efficacy. Emotional support can enhance the satisfaction of persons with low esteem with their assessment and comprehension of intervention objectives while simultaneously alleviating their fear and anxiety [36]. By meticulously analysing user interactions and emotional conditions, artificial intelligence systems can assist a user in establishing attainable objectives, surmounting cognitive distortions, and bolstering affirmative self-evaluations. The adaptability of learning can be utilised to foster a positive self-concept by providing personalised, supportive feedback aligned with individual growth [37].

Incites on the works analysing noncognitive skills, self-concept and its influences on furcating educational and occupational status during the transition to adulthood for youth is disadvantaged social circumstances [38]. These data unequivocally indicate that highly specialised interventions are necessary for a substantial population. Consequently, Indian researchers might expand their research views and applications by assimilating insights from global research frameworks and breakthroughs advancements expeditiously.

## Author Statements:

- **Ethical approval:** The conducted research is not related to either human or animal use.
- **Conflict of interest:** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper
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