

# Visual Mapping Analysis of International Research Hotspots and Trends for the MBTI Test

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## Abstract

Since its creation, the MBTI test has been widely used in the fields of counseling, management, and education. However, it has yet to be thoroughly studied in China. This paper uses the visual analysis software CiteSpace to analyze 468 MBTI-related publications from the Web of Science database (1990-2018). The study aims to clarify the development process and research trends of the MBTI test. We found that the MBTI originated in the United States and gradually spread globally. Its development has gone through four stages: theory interpretation, model explanation, type performance, and type application. Currently, research focuses on self-development, personality types, and online learning, indicating a shift from theory to practical application and from single-discipline to interdisciplinary development.

**Keywords:** CiteSpace, MBTI, visual knowledge graph, personality types

## 1. Introduction

In today's globalized and highly connected world, the ability to handle complex, dynamic, and unpredictable challenges is more important than ever. Traditional linear thinking—relying solely on rules, logic, and cause-and-effect reasoning—is no longer enough (Siggelkow & Rivkin, 2005). To thrive in such environments, individuals need to combine different thinking styles and adapt flexibly. Understanding and measuring these thinking styles within groups can help people grow and better navigate the complexities of modern life.

Enter the Myers-Briggs Type Indicator (MBTI), a personality assessment tool developed by Katharine Cook Briggs and her daughter Isabel Briggs Myers in 1942, based on Carl G. Jung's theory of personality. The MBTI-A scale, the earliest version of the test, was introduced in 1962 (Briggs-Myers, 1962). Jung believed that personality types are innate and shape how individuals perceive and interact with the world. He also suggested that people have unconscious tendencies, or archetypes, that influence their behavior (Ellis, 2009). The MBTI identifies 16 personality types, each defined by four dimensions: Extraversion (E) vs. Introversion (I), Sensation (S) vs. Intuition (N), Thinking (T) vs. Feeling (F), and Judging (J) vs. Perceiving (P). These types reflect how people gather information, make decisions, and approach life. Unlike trait-based models, the MBTI categorizes individuals into distinct types rather than placing them on a spectrum (Myers et al., 1998).

While the MBTI has faced criticism over the years, recent studies have bolstered its credibility. For example, a 2020 meta-analysis by Smith et al. found that the MBTI is useful in predicting job performance and career satisfaction. Additionally, cross-cultural research by Lee and Kim (2021) has shown that the MBTI can be effectively adapted for use in non-Western societies, highlighting its global relevance.

Since the 1990s, the MBTI has gained widespread popularity due to its strong theoretical foundation, focus on personality types (rather than traits), and its accessibility to the general public (McCrae & Costa, 1989). Despite some controversy, the MBTI has proven valuable in clinical, counseling, and educational settings. It has been used to predict personal challenges, group behavior, and even career success (Carlson, 1985; Davito, 1985). Internationally, it has been applied in fields like management, education, and counseling (Garrety, 2007), with potential for even broader applications in the future.

Comparison of previous studies, the MBTI has been a subject of extensive research and debate since its inception. Early

critiques, such as those by McCrae and Costa (1989), argued that the MBTI lacks the empirical rigor of other personality assessments, such as the Big Five personality traits model. They contended that the MBTI's dichotomous categorization oversimplifies the complexity of human personality, which is better captured by dimensional models like the Big Five. However, more recent studies, such as the meta-analysis by Smith et al. (2020), have provided evidence supporting the MBTI's predictive validity, particularly in organizational settings. This suggests that while the MBTI may not be as nuanced as some other models, it still offers valuable insights, especially in applied contexts. Cross-cultural studies have also shed light on the MBTI's adaptability. Lee and Kim (2021) found that the MBTI maintains its predictive validity across different cultural contexts, which contrasts with earlier concerns about its Western-centric bias. This finding aligns with the work of Garrety (2007), who argued that the MBTI's framework is flexible enough to be adapted for use in diverse cultural settings, particularly in management and education. In the field of education, the MBTI has shown promise in helping students understand their learning styles and career preferences. This application is supported by earlier research by Ellis (2009), who highlighted the MBTI's utility in academic counseling. However, some scholars, such as Davito (1985), have cautioned against over-reliance on the MBTI in educational settings, arguing that it should be used as one of several tools rather than a definitive measure of student potential.

Citespace to analyze research trends, we can gain insights into how the MBTI has evolved and where it's headed. This is especially important for adapting the MBTI to different cultural contexts, such as in China, where localized versions of the test could offer even greater relevance. Looking ahead, the MBTI's integration with emerging technologies—like artificial intelligence and neuroscience—opens exciting new possibilities. For example, recent studies have used brain imaging to explore the biological basis of personality types, while AI has been used to predict MBTI types based on social media behavior. These advancements could revolutionize how we understand and apply personality theory. In conclusion, the MBTI is far from outdated. It remains a powerful tool for personal and professional development, and its potential is still being unlocked. By continuing to research and refine the MBTI, we can better understand human behavior and help individuals thrive in an increasingly complex world.

## **2. Data Sources and Methodology**

### *2.1 Data Sources*

In order to explore the hotspots and trends of MBTI international research, the core data collection in the Web of Science (WOS) database was the source of the literature, and the search formula was “TS=Myers-Briggs Type Indicator”, with a total of 468 documents including authors' titles, abstracts, references and other information. Time-slicing was set to 1990-2018, with a default of 1 year as a time partition. Since the literature before 1990 has 0 search results on WOS, literature from 1990 onwards for the last 30 years is selected. Data sources were selected as Title, Abstract, Author Keywords (DE) and Key-words Plus (ID) for database. The node categories were selected as country, keyword, source, and cited reference. The visualization methods were selected as cluster view-static and show merged network.

### *2.2 Methodology*

In this paper, we use Citespace. V. 5.1 R8 SE developed by Prof. Chao-Mei Chen to visualize and map the data obtained, and apply bibliometric methods to explore the new dynamics and trends of the development of things under a certain time span. By analyzing the time-varying dyadic relationship between MBTI research fronts and intellectual bases, the trajectory of MBTI knowledge dynamics and the trend of fronts are visualized, and the clustering view and time-zone view are used to discover research hotspots and reveal the key turning points of knowledge evolution and their intrinsic relationships (Chen et al., 2015).

## **3. International MBTI Research: Spatial and Temporal Distribution, Research Hotspots and Evolutionary History**

### *3.1 Spatial and Temporal Distribution of MBTI Research*

We analyzed changes in the number of MBTI research publications and their distribution across countries and regions (see Table 1). Over the past 30 years, the volume of MBTI-focused publications has stabilized, but citation frequency has risen steadily, indicating growing scholarly interest. As shown in Table 1, 468 papers originated from various countries. To date, the United States, the United Kingdom, South Korea, China, and other nations dominate MBTI research, with the top five countries contributing 278 papers—59.39% of the total. The United States, as the birthplace of the MBTI, leads in both research output and applications, boasting the highest network centrality (0.12). Centrality, which measures the importance of nodes in a research network, highlights the pivotal role of U.S. studies. China follows closely with a centrality of 0.1, reflecting its significant influence.

Before the 21st century, research was concentrated in the United States (1990), Canada (1996), and the United Kingdom

(1996), with limited contributions from Hong Kong (China) and Italy. Since 2000, countries such as China, Australia, South Korea (2007), Iran, and Malaysia have expanded the field, focusing primarily on practical applications. While U.S. research emphasizes theoretical frameworks, other nations often build upon these foundations to explore real-world implementations.

Table 1. Distribution of major countries in the field of MBTI research, 1990-2018 (top five)

country	N	percentage	centrality	year
United States	209	44.66%	0.12	1990
United Kingdom	31	6.62%	0	1996
South Korea	17	3.63%	0	2007
China	12	2.56%	0.1	2000
Canada	9	1.92%	0	1996

The analysis of MBTI's disciplinary co-occurring domains can make it easier to understand the main disciplines in which MBTI is applied, and give full play to its advantages as well as serve as a reference for other disciplines. As shown in Table 2, the fields with centrality greater than 0.1 include "psychology", "education", "computer science", "business and economics", "engineering", "business and economics", and "business and economics". "These fields are crucial in the study of MBTI and have a great influence on other fields. However, the number of studies with large centrality is not necessarily large, due to the fact that centrality primarily measures importance and is not directly related to quantity. In terms of quantity, the number of studies in which the research topic and the field of psychology co-occurred reached 220, indicating that MBTI is mainly studied in the field of psychology. There are many intersections between the research fields of MBTI, which, to a certain extent, indicates that this field is an interdisciplinary field of study, which requires that the researcher possesses multidisciplinary knowledge in order to carry out the study in a better way, and in the process of the study, the disciplines can learn from each other and complement each other's strengths and weaknesses. complement each other's strengths and weaknesses.

Table 2. Distribution of co-occurrence of major domains of MBTI

No.	N	centrality	field
1	220	0.64	Psychology
2	69	0.31	Education& Education research
3	58	0.31	computer science
4	50	0.19	Business& Economies
5	48	0.14	Engineering
6	35	0.16	Management

### 3.2 MBTI Research Hotspots, Evolutionary History

Keywords reflect the core theme and main content of the article to be expressed, so the analysis of keyword word frequency changes can understand the research hotspots of MBTI. When two or more keywords, appear in the same literature is called keyword co-occurrence, and the analysis of its centrality can reveal the mutation or transformation relationship between research hotspots (Wang & Wu, 2014). Literature can reveal research themes and hotspots by analyzing keywords, and analyzing hotspots in the field of MBTI research enables researchers to grasp the main research in the field as well as the current status of research. Through CiteSpace analysis, the keyword visualization result graph of 468 documents has a total of 84 nodes and 301 connecting lines, and the density is 0.68, which indicates that the network clustering results are reasonable (see Figure 1 for details). Among them, the frequency of "MBTI" and "Myers-Briggs Type Indicator" is very high, but since these keywords appear as qualifiers for literature search, they do not reflect the core content of the articles and the hotspots of the research in this field, therefore, the keyword visualization results have 84 nodes and 301 lines (density is 0.68). and the hotspots of research in the field, therefore, these high-frequency keywords were not considered in the analysis. As in Figure 1, the higher frequency of the words personality, personality type, and behavior indicates that these topics are the focus of research, the circle represents the keyword node, the larger the node, the higher the frequency of the keyword, and the outermost edge of the circle shows the centrality of the keyword, and the clearer the edge, the higher the centrality of the keyword, i.e., the probability of the keyword appearing together with other keywords in the literature is higher, and the higher its co-occurrence network is also the more influential(Kang, 2018).

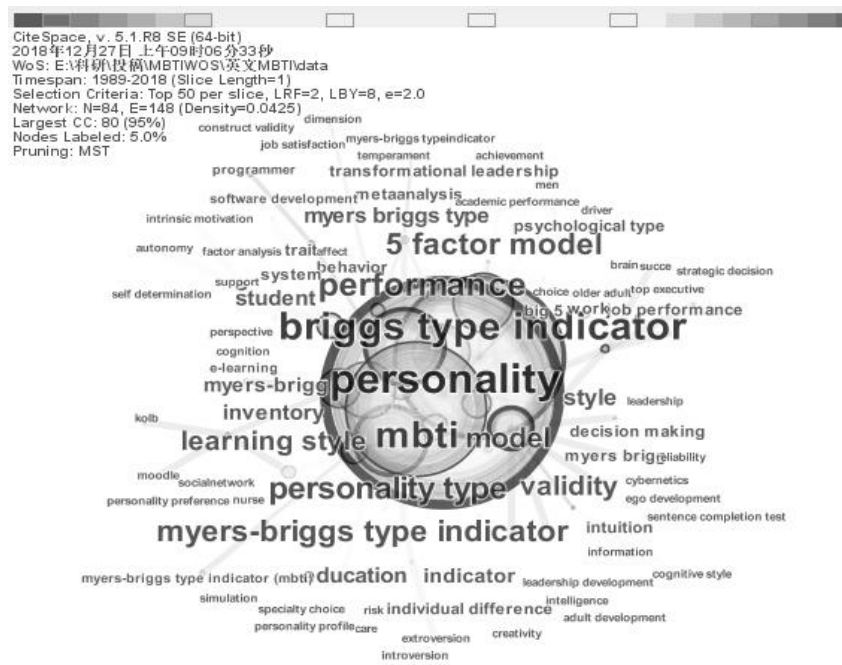


Figure 1. Knowledge map of keywords in the MBTI research area

A list of high-frequency keywords for MBTI research was tabulated by year for the occurrence of high-frequency keywords (see Table 3). In the visualized knowledge graph, words with a centrality (betweenness centrality) greater than 0.1 are indicative of a strong influence and an important inflection point where one research hotspot shifts to another. From the centrality of each high-frequency keyword listed in Table 2, it can be seen that the nodes with significant influence appeared in the years of 1993, 1995, 1998, and 2006, while the node-to-node transformation can be found in the evolution of MBTI research hotspots. According to the node-to-node transformation of keywords in Figure 1 and the centrality of high-frequency words in each year in Table 3, MBTI research from 1990-2018 can be divided into four stages:

Table 3. Centrality and frequency statistics of high-frequency keywords in MBTI research areas

Year Period	Year	Hot Words	Frequency	Centrality
1990-1994	1992	indicator	7	0.03
	1993	personality	88	0.46
	1993	model	21	0.05
	1993	style	10	0.1
	1993	behavior	4	0.06
	1993	decision making	4	0.05
	1993	job performance	4	0.02
1995-1997	1995	personality type	26	0.14
	1995	validity	15	0.05
1998-2005	1996	5 factor model	23	0.2
	1998	performance	29	0.19
	1998	inventory	9	0.1
	2000	student	9	0.12
	2002	trait	4	0.01
2006-2018	2003	individual difference	4	0.02
	2006	learning style	15	0.19
	2007	educational	9	0.09
	2007	intuition	4	0.04
	2010	affect	2	0.01
	2013	meta-analysis	4	0.05
	2013	job satisfaction	2	0.02
	2015	simulation	2	0.05

Phase I (1990-1994): mainly exploring the theoretical connotation of MBTI, analyzing the types of MBTI, focusing on behavioral performance and decision-making, mainly personality, model, type, etc., in which the centrality of personality is 0.46, which is much higher than 0.10, indicating that the theoretical basis of MBTI's personality is a hot spot of research and has a high academic influence. D. J. Pittenger's 1993 discourse on the functions of MBTI illustrates that MBTI tends to favor individual process validation (Pittenger, 1993). A. Furnham and P. Stringfield's 1993 cross-cultural study of personality and job performance through the MBTI exemplified the relevance of the test to performance management by testing the MBTI on middle and senior management in China and Europe (Furnham & Stringfield, 1993).

Phase 2 (1995-1997): The main focus was on the differences and validity of the personality type and personality factor theories, with emphasis on the MBTI personality types and the five-factor model. The key words with a centrality of more than 0.1 in this phase are "personality type" and "five-factor model". The limitations of the MBTI were discussed by G. J. Boyle (1995). A. Furnham (1996) discussed the relationship between the MBTI and the NEO-PI five-factor model of personality by discussing that scores on the NEO-PI Acceptability were only correlated with the Thinking and Feeling (T/F) dimensions; scores on the NEO-PI Responsibility were correlated with the Judgement and Perception (J/P) dimensions; and scores on the NEO-PI Extraversion were strongly correlated with the Extraversion and Introversion (E/I) dimensions, and NEO-PI Neuroticism scores were not associated with any of the MBTI subscale scores. The Openness dimension correlated with all four dimensions, especially the Sensing or Intuition (S/N) dimension (Furnham, 1996).

Phase 3 (1998-2005): The main focus was on the different types of MBTI manifestations, with a detailed catalog, and a focus on the application to students. The key words with a centrality of more than 0.1 in this phase are "performance", "student" and "inventory". M. D. Shermis and D. Lombard (1998) combined the MBTI with the Anxiety Rating Scale to explore different manifestations of MBTI types. H. Stumpf and W. D. Parker (2000) used the MBTI and a five-factor scale to measure a group of academically talented students and went on to explain the relationship between the hierarchical structure of perfectionism and personality traits.

Phase 4 (2006-2018): focuses on the application of the MBTI, mainly in the fields of education, career, and socialization. This stage is characterized by a wide range of applications, but not focused. The keyword with a centrality of more than 0.1 is "learning styles", for example, D. W. Salter et al. (2006) studied the stability of students' learning style preferences through the MBTI and Learning Styles Inventory (LSI) tests. Using the MBTI and LSI tests, students' learning styles preferences are more stable than those of the MBTI. Using the MBTI and the Cognitive Style Index test, linear and nonlinear thinking were investigated, and the Linear-Nonlinear Thinking Styles Framework (LNTSP) was proposed for use in educational administration and business practice (Vance et al., 2007). J. E. Pretz and K. S. Totz (2007) used two subscales of the MBTI to test individual differences in affective, heuristic, and holistic intuition and suggested possible implications for subjects' future work. W. K. Kay and L. J. Francis used the MBTI-G in 2008 to examine the psychological types of female Bible students in the United Kingdom, comparing it to a population norm and finding that students at the school had higher values of "intuition" than those in the norm. "Intuition" was found to be higher than in the norm (Kay & Francis, 2008).

#### 4. MBTI Research Frontiers

In the Citespace study, the Cited Reference was analyzed for research frontiers. Clustering the co-cited literature, the graph includes 208 nodes and 430 connecting lines, and there are several prominent nodes in the literature co-citation network, which directly reflects the knowledge base of the MBTI field, and the highly cited literature plays the role of a good mediator, which is the key point of the network for the transition from one time period to another. Therefore, analyzing these key points is of great significance in exploring the classical literature in the field of MBTI. Based on the co-citation of the literature in the journals, the top five ranked literature were selected, with the largest node being the Manual for the Development and Use of the MBTI (1985). It is worth mentioning the five most frequently cited documents:

The first and second most cited documents in total are the two versions of the manual for using the MBTI. *Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator*, published by I. B. Myers et al. in 1985, was cited 20 times with a centrality of 0.03. The revised version of *MBTI Manual: A guide to the development and use of the Myers-Briggs Type Indicator*, published by I. B. Myers in 1998, was cited 17 times with a centrality of 0.06. Since the MBTI test is the primary instrument used in research, the citation rate for the manual is higher. The main content deals with the application of the Myers-Briggs Type Indicator with the aim of making the theory of psychological types described by Jung understandable and usable in people's lives (Myers et al., 1998).

Ranked third is the paper by R. R. McCrae and P. T. Costa (1989), *Reinterpreting the Myers-Briggs Type Indicator From the Perspective of The 5-Factor Model of Personality*, was cited 12 times with a centrality of 0.01. This literature

focuses on assessing the Myers-Briggs Type Indicator, primarily from the perspective of Jung's Psychological Type Theory and the Five Factor Model of Personality, which is measured by self-report and peer rating on the NEO Personality Inventory. Data were provided by 267 males and 201 females, aged 19-93 years. The instrument measures four relatively independent dimensions, and the interpretation of the "perception" index has been questioned. The data suggests that either Jung's theory is incorrect or that the MBTI is under-researched and does not provide a sound basis for its interpretation. However, correlational analyses suggest that the four dimensions of the MBTI do measure four of the five major dimensions of normal personality, providing an alternative basis for interpreting MBTI results within a broader, more commonly shared conceptual framework (McCrae & Costa, 1989).

Ranked fourth was the journal article *Review of Research on the Myers-Briggs Type Indicator* by J. B. Murray (1990), with a citation frequency of 10 and a centrality of 0.01. This literature focuses on the MBTI as a psychometric tool to synthesize research on the application of Jung's typology to non-psychiatric populations. The MBTI relies on the choice between extroverted or introverted attitudes, sensations, or intuitions, as well as describing and distinguishing between human sensations or perceptual functions based on their preferred way of thinking (Murray, 1990). The reliability and validity of the MBTI are widely recognized and the theoretical framework of the MBTI is supported by relevant research.

Ranking fifth was the journal paper *Recent Assessment of the MBTI* by J. G. Carlson (1985) with a citation frequency of 9 and a centrality of 0.01. This literature focuses on nearly two dozen recently published studies that have examined the reliability and validity of the MBTI in clinical, counseling, and research settings, several assessments of split-half and retest reliability for the four dimensions of the two standardized versions of the MBTI-F and MBTI-G have also yielded good correlations overall, and a large number of studies on the structural validity of the MBTI have provided research hypotheses support for the research hypotheses, which include the correlation of the MBTI with personality scales, couples' issues in counseling settings, and type judgments in groups, among others (Carlson, 1985). As a result, the MBTI has a wide range of applications, generally good validity assessments, and continued attempts to validate the instrument in a variety of domains are needed.

In addition, what is emphasized in the research frontier is the new trend as well as the mutation characteristics, and the timeline visualization (Timeline View) enables us to detect the research frontier of MBTI. As can be seen in Figure 2, the critical path graph of MBTI's timeline clustering graph consists of 84 nodes and 301 connecting lines, with a Q-value of 0.49 and an S-value of 0.73, which indicates that the network clustering results are superior. The frontiers of research on MBTI yielded a total of seven clustering terms: ego development, personality types, e-learning, personality, factor analysis, style, and autonomy. The hot keywords included in each cluster and the timeline of their development are shown in Figure 2. Recent research focuses on the three clusters of self-development, personality type and online learning, and both self-development and online learning focus on learning, indicating that MBTI is closely related to research in the field of education, which may be a trend for the future development, and the personality theories used in MBTI are still being deepened and researched in the field of psychology, and the test of MBTI has also been widely used.

Through the high-frequency emergent words and vein evolution, it can be found that MBTI test results describe people's different preferences for interests, abilities, and learning styles, and the four dimensions expanded based on Jung's theory of personality are also widely recognized, and have been widely used in the fields of education, management consulting, and psychological counseling. It can be seen that self-development research based on behavioral performance, leadership, learning, cognition, and management; personality type research based on personality theory, type theory, indicators, and models; learning type research based on learner, behavior, satisfaction, and temperament traits; factor analysis research based on individuals, attitudes, and elements, and type research based on decision-making, evaluative ratings, performers, self-comparison tests, and structure; motivation based, Determination, Essence, Adolescent, and Patterns of Autonomy studies will all be at the forefront of MBTI research.

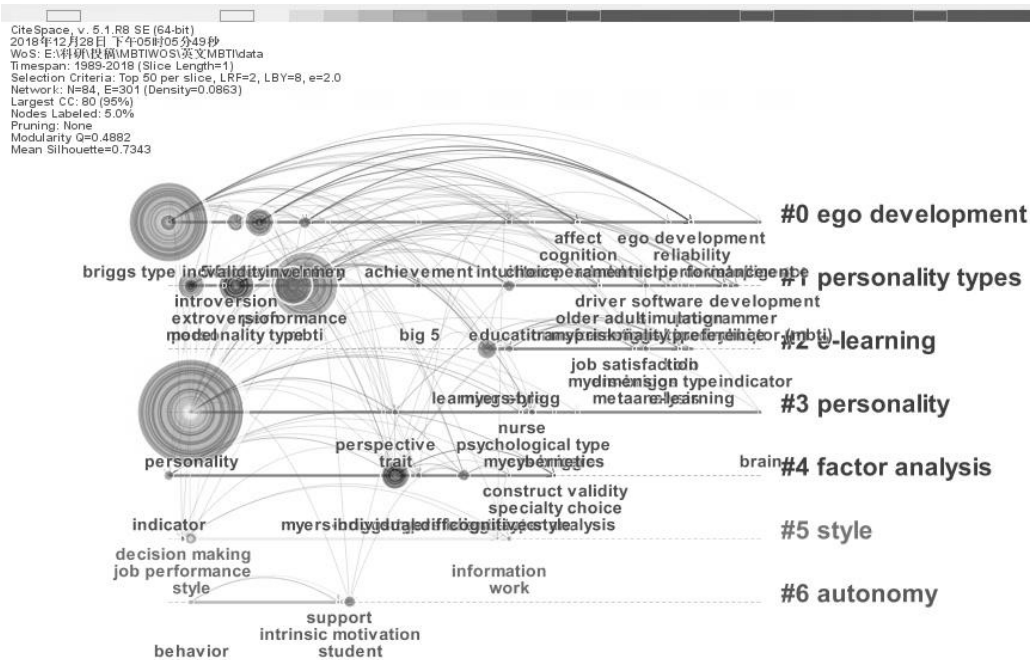


Figure 2. Timeline Labeling Diagram of the MBTI Study

### 5. Conclusions and Implications

During the nearly three decades from 1990 to 2018, the course of international research on MBTI is roughly divided into four stages: the first stage (1990-1994) focuses on exploring the connotation of personality and the classification of personality types, and pays attention to behavioral performance and decision-making; the second stage (1995-1997) pays attention to the linkage and difference between the theory of personality types and the theory of personality factors; the third stage (1998-2005) focuses on the behavioral performance of different types of MBTI and attaches importance to the application in the field of education; the fourth stage (2006-2018) focuses on the application of MBTI, mainly in the fields of education, occupation, socialization and so on, and shifts from the theory to a wide range of practical applications. Between 1990 and 2018, there were five shifts in the international research on MBTI: first, the shift from theory to application; secondly, the shift from single-discipline research to interdisciplinary research; thirdly, the shift from the study of personality type theory to the use of personality type strategies; fourthly, the shift in the scope of application from the field of education to the application of multiple fields; and fifthly, the shift from the study of personality theories to the factors influencing them. On the whole, the current international MBTI research frontiers mainly include: education, management, self-development, learning types, psychological types, influencing factors, leadership, and behavioral performance.

Using Citespace software to analyze the literature related to MBTI research in the WOS database in the past thirty years, the bibliometric study of international MBTI research hotspots, cutting-edge fields and evolutionary lineage not only broadened the domestic perspective on MBTI research, but also inspired researchers to deepen the domestic MBTI applied research and increase the scope of research subjects in practice. Combine the factor analysis with China's cultural background, make localized modification of MBTI test through cross-cultural research, use the personality type theory of MBTI to match with related occupations, and combine different personality types for career planning research, conduct longitudinal validation of MBTI research, further deepen the personality theory, and explore whether the personality types change over time.

Recent studies have further expanded the scope of MBTI research, particularly in the integration of personality psychology with emerging technologies. For instance, advancements in neuroscience have allowed researchers to explore the neural correlates of MBTI personality types. A 2022 study by Johnson et al. used functional magnetic resonance imaging (fMRI) to identify distinct brain activity patterns associated with different MBTI types, providing empirical support for the biological underpinnings of personality traits as proposed by Jung (Johnson et al., 2022). This research bridges the gap between psychological theory and neuroscience, offering a more comprehensive understanding of how personality types manifest at the neurological level.

Cross-cultural research on the MBTI has also seen significant advancements. A 2023 meta-analysis by Zhang et al. examined the applicability of the MBTI across 15 different cultures and found that while the core dimensions of the

MBTI remain consistent, certain cultural nuances influence the expression and interpretation of personality types (Zhang et al., 2023). This finding underscores the importance of cultural adaptation in the application of the MBTI, particularly in non-Western contexts.

The findings of this study contribute to the existing body of knowledge on the MBTI in several ways. First, the visual mapping of MBTI research trends provides a clear overview of the field's development over the past three decades. Second, the identification of research hotspots and frontiers highlights the shift from theoretical exploration to practical application, particularly in education and career counseling. The integration of MBTI research with other disciplines, such as neuroscience and artificial intelligence, is another promising area for future research.

Future research should focus on further validating the MBTI's reliability and validity, particularly in non-Western cultures. Additionally, the integration of MBTI research with emerging technologies, such as artificial intelligence and big data, offers exciting opportunities for advancing our understanding of personality. Longitudinal studies that track changes in personality types over time, as well as research that explores the interaction between personality types and environmental factors, will also be crucial for deepening our understanding of the MBTI's applicability in diverse contexts.

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#### **Data sharing statement**

No additional data are available.

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