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A Visual Analysis of Sports Interest Research in China Since the 1990s Based on Citespace

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ABSTRACT

This paper systematically combs through the development trajectory, research hotspots, and collaboration networks in the field of sports interest in China since the 1990s using the CiteSpace visualization analysis tool. The research data were derived from 896 core journal articles screened from the China National Knowledge Infrastructure (CNKI) database. The study employed methods such as annual publication volume analysis, author and institutional collaboration networks, keyword co-occurrence, clustering, and burst detection. The results show that the annual publication volume in this field follows an inverted U-shaped trend, peaking in 2007 and then declining year by year. Research efforts are concentrated in normal and sports universities, but the density of collaboration between institutions and authors is low, presenting an overall fragmented state. Research hotspots focus on keywords such as “school sports,” “physical education,” “interest,” and “college students,” and have evolved from being a teaching auxiliary tool to a core literacy element, and from a single interest dimension to a fusion with technology and innovation in curriculum models. In the future, cross-institutional cooperation should be strengthened to promote the continuous development of sports interest research under the deep integration of digitalization and education, in order to facilitate the comprehensive and healthy development of young people.

1.Introduction

Adolescence is a critical transition period from childhood to adulthood. During this stage, with the rapid maturation of the body and mind, adolescents' self-awareness gradually strengthens, but their emotional stability is relatively weak. In 2020, 2021, and 2022, the state issued a series of sports policy documents, such as the integration of sports and education and the "double reduction" policy, which greatly emphasized the physical and mental health of adolescents . In October 2022, the 20th National Congress of the Party made corresponding instructions on youth sports work,

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pointing out in the report that it is necessary to implement youth sports work well to promote the development of national fitness and health (Wang, 2021). Studies have found that improper educational guidance can easily lead to various psychological problems in adolescents (Zhang, 2022). Therefore, it is necessary for the public to have a certain interest in sports as a foundation to actively respond to relevant policies.

Interest in sports refers to a psychological tendency of people to actively understand, explore, or participate in sports activities(Hu, 2025). It is an important driving force for acquiring knowledge and skills in sports and health(Yang, 2025)and for promoting physical and mental health (Ji, 2016). Interest in sports is a key psychological variable affecting the physical activity (Physical Activity, PA) of children and adolescents aged 3 to 17. It can stimulate children's curiosity (KRAPPA, 1992), making them more focused in activities; it also allows them to enjoy the activities themselves , thus investing more enthusiasm and generating a strong sense of belonging (FORGEARD, 2019). Against the current background of building a powerful sports nation, it is necessary to deeply reflect on and summarize the current situation of the public's interest in sports. Researchers and sports workers in relevant fields need to grasp the current situation and main existing problems in the field of sports interest (SALLIS, 2000), which will help scholars in the field of sports interest to explore research, promote the in-depth development and reform of the field, and improve the public's enthusiasm for sports (Wang, 2021). Based on this, I used the Citespace tool to conduct a visual analysis of the field of sports interest research in China since the 1990s.A section dedicated to the significant literature resources, consulted or employed, that contributed to the study. (Zhang et al., 2025)

2. Data Sources and Methods

2.1 Data Sources

This paper uses the China National Knowledge Infrastructure (CNKI) database as the main platform for searching research data. By employing its advanced search function, the search was conducted with the theme of “sports,” followed by a search within the results for “interest,” and finally, the search was refined to include “exercise” (Huo, 2018). To understand the research history of core journals published in the field of sports interest in China, the search period was from July 6, 1992, to September 10, 2025 (search date: September 13, 2025). The initial search yielded 35,196 research papers related to sports teaching evaluation. After refining the search results to include only those from the Peking University Core Journal and CSSCI, and carefully screening out invalid documents such as conference papers, newspapers, and books, a final sample of 896 valid research papers that met the study criteria was obtained. This sample forms the basis for the data analysis in this study.

2.2 Research Methods

Using CiteSpace version 6.4.R1 (64-bit), the research literature was processed. The 896 valid papers screened from the China National Knowledge Infrastructure (CNKI) database were exported in Reforks format and renamed as download_x.txt. The Time Slicing was set from 1992 to 2025, with Years per slice set to 1 year. The parameter threshold was set to k=25, while Term source, Pruning, and Links strength were set to the system defaults. Node types were selected as Author, Institution, and Keyword. After setting all the parameters, the corresponding knowledge maps were drawn to conduct a visual analysis of the research literature on sports interest in China since the 1990s.

3.Results and Analysis

3.1 Annual Publication Analysis

When analyzing the development process of a research field using bibliometric methods, according to the growth and aging patterns of scientific and technological literature (Li, 2017), the annual statistical analysis of the number of publications can reveal the current development status of the field (Li, 2025) and predict its research prospects and development trends (Chen, 2016). As shown in Figure 1, the annual number of publications from 1992 to 2025 shows an overall inverted U-shaped development. Chinese core journals on sports interest began to publish in 1992 and continued to rise from 1992 to 2016, reaching a peak in 2007 with 60 articles published. From 2016 to 2025, the number of publications showed an overall downward trend with a continuous decrease, reaching the lowest value of 6 articles in 2024.

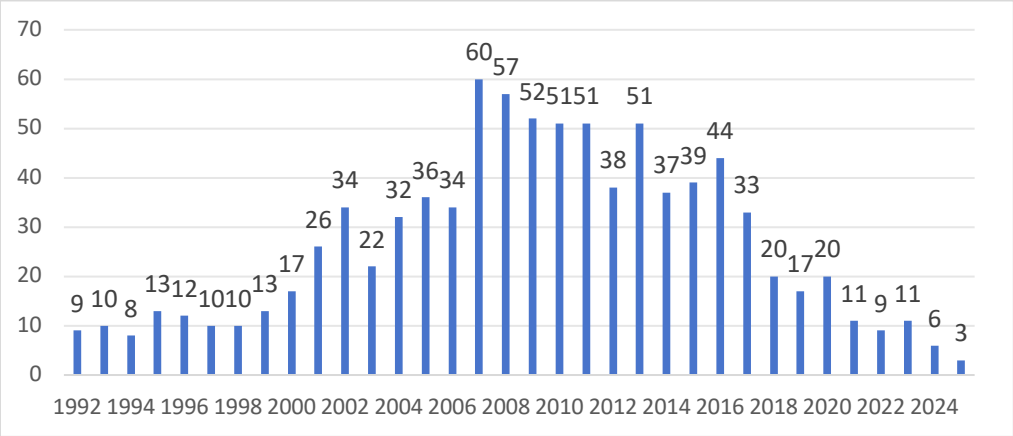

Figure 1: Annual Publication Volume on Sports Interest in China from the 1990s to the Present

3.2 Scientific Collaboration Network Analysis

3.2.1 Publishing Institution Analysis

The development of scientific research requires the support of research institutions. Visualizing research institutions not only helps to understand their research capabilities in the field of sports teaching evaluation, but also identifies the key forces driving the development of this field (Gao, 2022). Using Citespace software with Nodetypes set to “Institution” and other parameters unchanged, a network map of research institutions was drawn (Figure 2). In this map, the top ten institutions in terms of publication volume were identified. Among them, the School of Physical Education and Health at East China Normal University had the highest number of publications, with 10 articles. (The School of Physical Education at Northeast Normal University ranked second with 11 publications; Beijing Sport University ranked third with 8 publications; the School of Physical Education at South China Normal University and the School of Physical Education and Training at Shanghai University of Sport were tied for fourth place, each with 5 publications.)

As shown in Figure 2, the 578 nodes represent 578 institutions that have participated in the research on sports interest. The research institutions are mainly normal universities or sports colleges. The 173 nodes indicate that 173 research institutions have participated in the research on sports teaching evaluation. The research institutions are mainly distributed in normal universities and sports universities. However, there are only 41 connections between nodes, with a cooperation density of only 0.001, indicating that the cooperative relationships between institutions are not close. Most institutions mainly conduct independent research, and there is a lack of communication and cooperation between institutions.

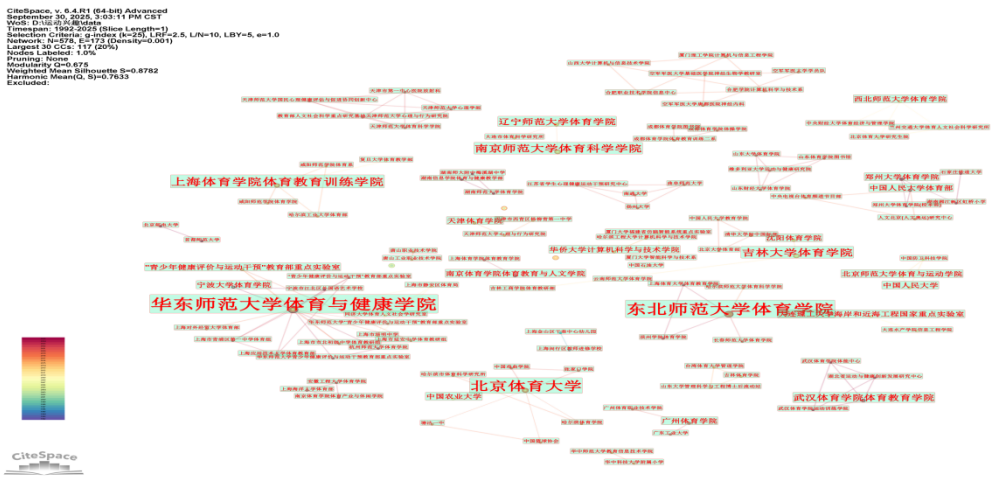

Figure 2: Publication Situation on Sports Interest in China from the 1990s to the Present

Table 1: Top Ten Institutions in China in Terms of Publications on Sports Interest from the 1990s to the Present

Rank	Number of Publication	Institution	Rank	Number of Publication	Institution
1	13	School of Physical Education and Health, East China Normal University	5	4	School of Physical Education, South China Normal University
2	11	School of Physical Education, Northeast Normal University	5	4	School of Physical Education, Nanjing Normal University
3	8	Beijing Sport University	5	4	Shanghai University of Sport
4	5	School of Physical Education, South China Normal University	5	4	School of Physical Education, Jilin University
4	5	School of Physical Education and Training, Shanghai University of Sport	10	3	School of Physical Education, Wuhan Institute of Physical Education

3.2.2 Author Analysis

Using CiteSpace software with Nodetypes set to “Author” (RAMEY, 2019) and other parameters unchanged, a network map of research authors was drawn (Figure 3). In this map, the top 12 authors in terms of publication volume were identified (Table 2), with Ji Liu having the highest number of publications at 11 articles.

In the author co-occurrence map, the node is a very important indicator. The number of nodes represents the number of research authors, the color of the nodes indicates the publication year, and the connections between nodes reflect the cooperative relationships between authors. As shown in Figure 3, there are 692 nodes in the map, indicating that 692 authors have participated in the research on sports teaching evaluation. The nodes are connected 342 times, meaning that there have been 342 instances of collaboration between authors. The network density is 0.0014. The number

of nodes is significantly higher than the number of connections, indicating that the overall collaboration among authors in the field of sports interest research in China tends to be fragmented (Xie, 2017). Only a few core author groups have been formed, with a low degree of collaboration among authors and mainly small-scale cooperation. In addition, there are many authors who publish articles independently.

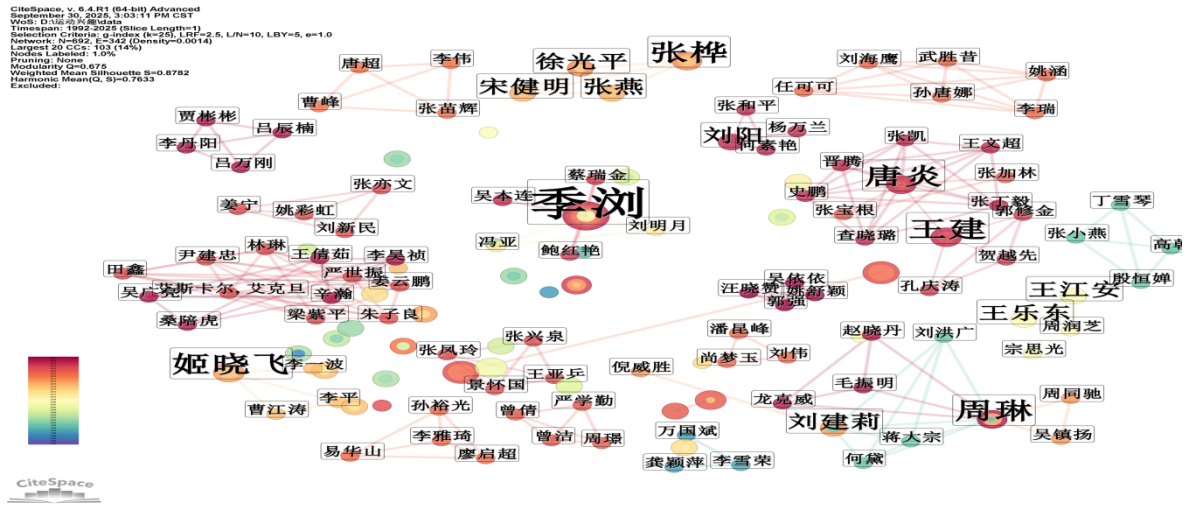

Figure 3: Author Publication Volume on Sports Interest in China from the 1990s to the Present

Table 2: Top Ten Authors in China in Terms of Publications on Sports Interest from the 1990s to the Present

Rank	Number of Publications	Author	Rank	Number of Publications	Author
1	7	Ji Liu	4	3	Duan Jianzhi
2	4	Chai Jiao	4	3	Zhang Hua
2	4	Lin Jiabin	4	3	Tang Yan
4	3	Sun Youping	4	3	Ji Xiaofei
4	3	Zhou Lin	4	3	Yu Sumei
4	3	Wang Jian			

4. Keyword Analysis

4.1 Keyword Co-occurrence Analysis

Using CiteSpace software with Nodetypes set to “Keyword” and K value set to 25, while selecting the Pathfinder algorithm and comprehensive network drawing, a keyword co-occurrence map was generated (Figure 4). The keyword co-occurrence map can intuitively reflect the research hotspots in a field, and the frequency of keywords can to some extent indicate the distribution of research hotspots and directions in that field (Qu, 2023). Nodes correspond one-to-one with keywords; the larger the ring, the higher the frequency of the keyword. The color of the ring represents different years, and nodes with purple rings are key nodes in the keyword co-occurrence network (centrality greater than 0.1). The higher the centrality of a keyword, the larger the font size, and the lines represent the degree of association between keywords (Gao, 2022). In Figure 4, there are 211 keyword nodes and 354 connections between nodes. The number of connections is significantly higher than the number of nodes, indicating that the keywords are closely related.

Based on the data parameters obtained from the CiteSpace visualization analysis, the top 10 keywords in terms of frequency and their centrality were statistically analyzed and compiled into a table (Table 3). The research hotspots also need to consider the betweenness centrality of keywords. A high centrality of keywords indicates that they are more closely connected with other content in the research field. The top 3 keywords in terms of centrality are “school sports” (0.19), “interest” (0.15), and “physical education” (0.14), indicating that they are at the core of the keyword co-occurrence network and have a higher degree of importance.

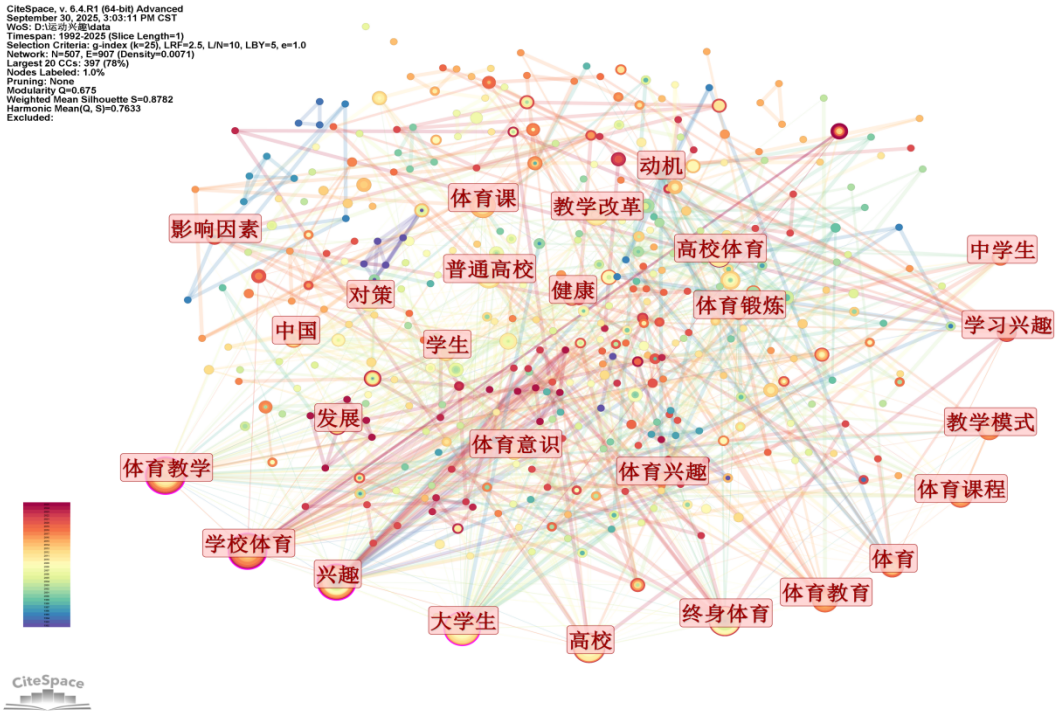

Figure 4: Keyword Co-occurrence Map

Table 3: Keyword Frequency and Centrality

Frequency	Centrality	Keyword	Frequency	Centrality	Keyword
53	0.19	School Sports	19	0.07	Sports
58	0.14	Physical Education	20	0.06	Sports Education
46	0.14	College Students	16	0.02	Sports Curriculum
30	0.15	Interest	16	0.04	Physical Education Class
26	0.09	Lifelong Sports	14	0.03	General Universities
26	0.06	Universities	14	0.03	University Sports

4.2 Keyword Cluster Analysis

To further explore the research trajectory and knowledge structure in the field of sports interest, this study used the Log-Likelihood Ratio (LLR) algorithm to extract keyword cluster labels and draw a cluster map (Figure 5). The modularity value (Q value) and average silhouette value (S value) of the cluster network are used to assess the significance of the cluster structure and its internal homogeneity. Generally, $Q > 0.3$ indicates significant community structure, $S > 0.5$ means reasonable clustering, and $S > 0.7$ suggests that the clustering results are efficient and highly convincing (Gao, 2025). The Q and S values obtained in this study both exceeded the threshold for efficient clustering, indicating that the cluster structure is significant and reasonable, and the results are credible. In this study, the Q value was 0.8556 and the S value was 0.9437, indicating that the

11 clusters are relatively concentrated and overlapping, suggesting that the field of sports interest is relatively focused.

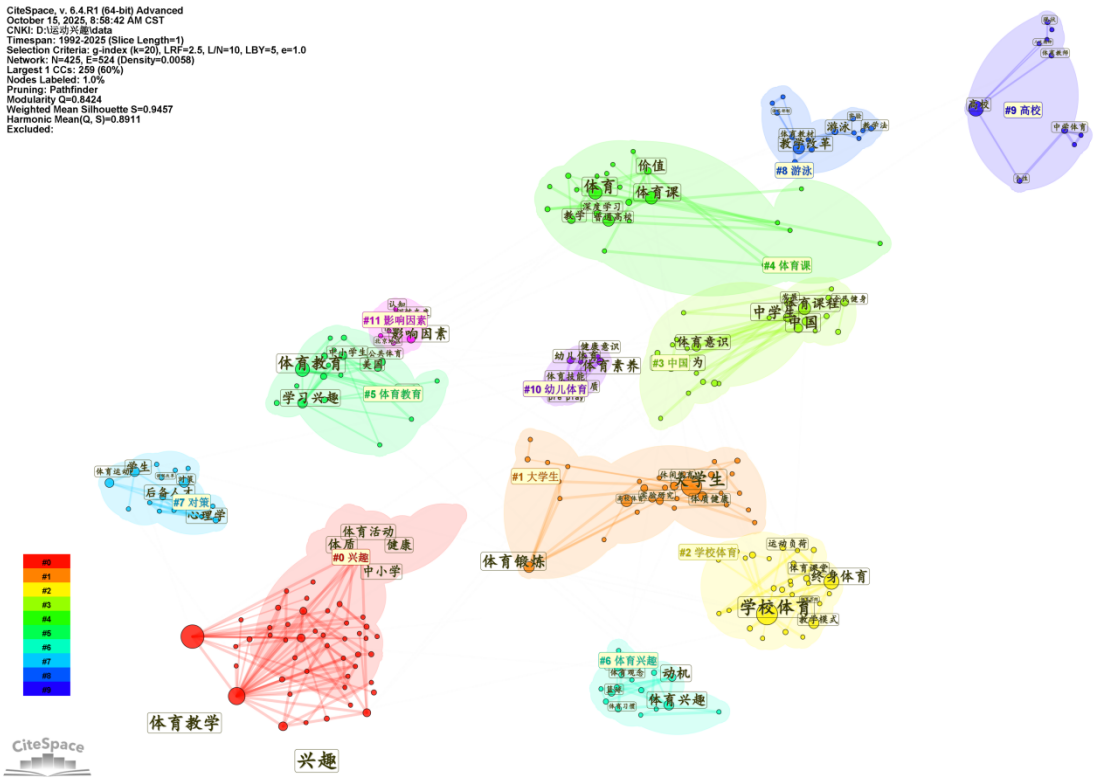

Figure 5: Keyword Clustering

4.3 Keyword Burst Detection and Timeline Analysis

Bursting keywords reflect themes that have been highly focused on by researchers during a specific period. Based on the analysis of the keyword clustering timeline map (Li, 2022), analyzing the burstiness of keywords can not only grasp the macro development trend of a research field but also focus on new developments at key nodes (Lu, 2023). To explore the evolution of sports interest, the Burstness function of CiteSpace software was used to generate the bursting keywords in the field of sports interest. The bursting keywords were then organized into a table using Excel (see Table 2), with a total of 4 keywords identified as having burst characteristics. The keyword with the strongest burst is “interest in learning,” indicating that it is a cutting-edge research topic in this field, with a large number of studies and significant impact. The earliest bursting keyword is “lifelong sports,” which began to attract considerable attention in 1999.

The steps to perform timeline analysis involve adjusting the view to the Timeline format to obtain the keyword timeline map (Figure 7). The timeline map can be generated using the Timeline view module in CiteSpace software, which helps to depict and display the trajectories and time spans of important keywords within each cluster. High-frequency and high-centrality keywords can be used to identify research hotspots and the evolution of knowledge (Lu, 2025). Analysis of the timeline view in Figure 7 reveals that the theme clusters generated through co-occurrence network analysis are labeled with high-frequency keywords from the network. These keywords are not static but dynamically unfold along the timeline of their respective clusters based on the year they first appeared or surged, clearly outlining the evolution and lifecycle of core concepts within each research theme. Combining this detailed timeline view with the “keyword burst map,” which identifies short-term high-impact keywords, creates a multidimensional analytical framework. This

framework not only visually reconstructs the macro process of the origin, development, and integration of different hotspots in the field of sports interest but also profoundly reveals the underlying patterns of paradigm shifts. A systematic analysis of this structural framework allows us to go beyond a simple summary of historical trends and provides a solid theoretical basis and forward-looking vision for accurately predicting the research directions in this field over the next few years.

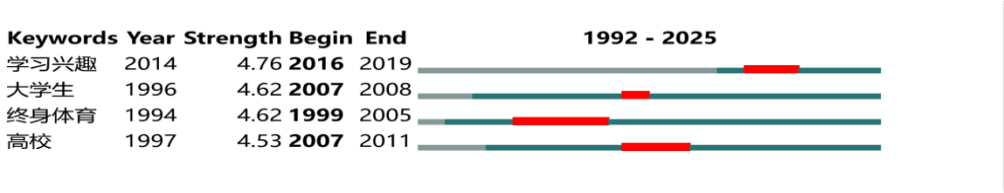

Figure 6: Keyword Burst Detection

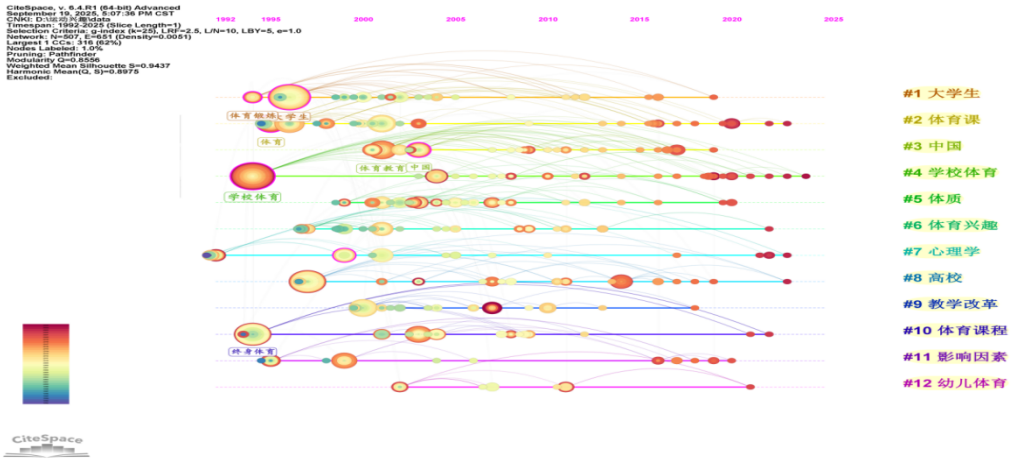

Figure 7: Keyword Timeline

5. Discussion

5.1 Analysis of Publication Volume, Authors, and Institutions

Analysis of the annual publication volume reveals that since the 1990s, the number of articles in the field of sports interest in China has shown a wave-like development trend, with the peak publication volume occurring in 2007, with 60 articles published. This surge may be related to the issuance of the "Opinions of the Central Committee of the Communist Party of China and the State Council on Strengthening Youth Sports and Enhancing the Physical Health of Young People." The document emphasized that enhancing the physical health of young people and promoting their healthy growth is crucial to the future of the country and the nation. Taking the hosting of the 2008 Beijing Olympic Games as an opportunity, further strengthening youth sports and enhancing their physical health was of profound significance for fully implementing the scientific development concept, deeply implementing the Party's educational policy, vigorously promoting quality education, and cultivating qualified builders and successors of the cause of socialism with Chinese characteristics. The hosting of the Beijing Olympic Games greatly propelled the development of China's sports industry and sparked widespread public attention to sports. Against this backdrop, research in the field of sports interest received extensive attention from experts and institutions, maintaining a high level of publication volume during this period. The year 2020 marked a period of research stagnation, with a significant decrease in the number of related articles in China, likely due to the outbreak of the COVID-19 pandemic. The reduction in sports activities made it difficult

to conduct research on sports interest, leading to a yearly decline in publications in this field since then.

From the data above, it is evident that there is a significant interplay between policy orientation and academic research output. Positive policy support not only provides a clear framework and resources for research but also directly guides the direction of the academic community's exploration, thereby stimulating research vitality and promoting an increase in publication volume. Correspondingly, when policies enter a stable or adjustment phase, the focus of academic attention shifts, which may lead to a flattening or decline in publication volume in specific fields. Meanwhile, the public's real concern and urgent demand for the physical health of young people, as another key driving force, also profoundly influence the agenda-setting and output scale of academic research(Hu et al., 2025).

In terms of research collaboration networks, the author with the highest number of publications is Ji Liu from the School of Physical Education and Health at East China Normal University (7 articles), with 4 articles not co-authored with other institutions. His research focuses on sports learning interest, student physical health, and the concept of "health first" (Pan, 2025). A small-scale research team composed of Zhang Baogen, Tang Yan, Hu Xiaoqing, and Zhang Jialin mainly investigates sports psychology, psychological needs, situational interest, and learning engagement(Hu, 2025b).

Regarding publishing institutions, the School of Physical Education and Health at East China Normal University has the largest node (12 publications) and is an important research institution in the field of sports interest. Located in Shanghai(Huang et al., 2025a), the institution benefits from well-developed infrastructure and a solid economic foundation, providing fertile ground for research in this field. Under the leadership of Professor Ji Liu, the research team has conducted numerous studies and possesses important research bases such as the Research Center for Youth and Social Work and the Key Laboratory of Youth Health Evaluation and Exercise Intervention of the Ministry of Education, which are significant for advancing research in the field of sports interest in China. In contrast, sports colleges such as Wuhan Institute of Physical Education have not collaborated with other institutions and lack research in the field of sports interest(Hu & Huang, 2025.).

In summary, since the 1990s, research in the field of sports interest in China has focused primarily on "physical education," "school sports,"(Hu, 2025). and "interest." Research institutions are mainly concentrated in sports colleges and normal universities. However, cooperation between authors and institutions is not close and the efficiency of collaboration is low, forming a few small cooperative groups with minimal interaction between them(Hu & Huang, 2025). In the future, there should be enhanced cooperation and exchange among multiple regions, institutions, and even countries(Wan et al., 2025).

5.2 Analysis of Research Hotspots

Co-occurrence analysis of keywords reveals that the hotspots in the field of sports interest are mainly concentrated on two aspects: "college students" and "interest." (1) Research on "college students" was greatly encouraged by the issuance of the "Opinions of the Central Committee of the Communist Party of China and the State Council on Strengthening Youth Sports and Enhancing the Physical Health of Young People" on May 7, 2007. Starting from this key document, a series of supporting policies followed, advancing the cause step by step. The government focused on

management system innovation and macro "action plan" leadership, while schools concentrated on in-depth changes in curriculum teaching and evaluation systems. Under this coordinated effort, a nationwide reform practice aimed at strengthening school sports and improving student physical health was fully launched. Against this wave, the field of sports interest research made significant progress in 2008(Dowling & Manias, 2025). (2) "Interest" (including interest in sports learning and situational interest) is a key driver for sports exercise, especially for the learning of sports skills. Its promoting effect can be systematically explained based on the triadic reciprocal causation model of social cognitive theory: at the personal level, the positive emotions induced by interest can effectively reduce individuals' subjective perception of skill difficulty (for example, the "sense of conquest" in rock climbing); at the environmental level, recognition from peers and feedback from coaches constitute positive social incentives(*Hu 等 - 2025 - The Role of Self-Objectification and Physical Exercise in Social Appearance Anxiety and Restrained e.Pdf*, n.d.), thereby consolidating and strengthening interest (for example, the team atmosphere in football training); at the behavioral level, repeated practice driven by interest, through promoting the myelination of neural pathways, ultimately achieves the automatic execution of skills (for example, the unconscious badminton stroke movement (Liu, 2025). Therefore, increasing the interest level of exercisers during sports activities may help promote the learning of sports skills(Hu, 2025).

3.3 Analysis of Research Trends

Reviewing the evolution of research on "sports interest" in the field of school sports in China over the past three decades(Huang et al., 2025b), a profound transformation path from marginal assistance to core drive and from a single dimension to multidimensional integration can be clearly observed. This process not only reflects the renewal of school sports education concepts but also mirrors society's increasing emphasis on the health and comprehensive development of young people.

In the 1990s (1992-1999), school sports research was in the exploratory stage, with discussions on interest mainly focusing on the core keywords "school sports" and "learning interest." During this period, research generally regarded sports interest as an auxiliary tool and Ancillary results for achieving "mastering sports skills" and "improving classroom effectiveness." The underlying logic emphasized the role of interest in promoting skill acquisition, with the starting point of research being more about improving classroom teaching efficiency. The intrinsic value of interest itself had not yet been independently and deeply examined. It seemed like a "catalyst" to make traditional physical education more acceptable, but its core position as an intrinsic psychological need and foundation for lifelong development of students had not yet been established(Deng et al., 2025).

Entering the 2000s (2000-2009), with the comprehensive launch of the national basic education curriculum reform, the research perspective was greatly broadened. The frequent appearance of keywords such as "sports curriculum reform" and "physical and mental development" marked that research on sports interest was no longer limited to the micro classroom context but began to move in tandem (Hu, 2025a)with the macro educational reform wave. Peng Guoxiong analyzed the relationship between sports teaching concepts and teaching models and, in combination with the preliminary achievements of school sports teaching reform, proposed ideas and countermeasures for reforming the sports teaching model in general universities under the new sports teaching concepts (Peng, 2009). During this period, Zhang Li proposed the sports lifestyle of middle school students, which is characterized by the ability to regulate people's physiological, psychological, and social adaptation capabilities (Zhang, 2009). Interest was assigned greater

significance in this stage—it was not only the driving force for short-term participation but also a "necessary condition" for cultivating students' long-term sports habits and promoting their coordinated physical and mental development. Research began to consciously draw on educational psychology theories, emphasizing the use of interesting teaching content design and reform orientation to serve students' more comprehensive growth goals. Interest began to shift from an "auxiliary factor" to a "foundation for development."

In the 2010s (2010-2019), relevant research showed significant characteristics of systematization and refinement. First, the theoretical depth was strengthened. The emergence of the keyword "situational interest" indicated that the academic community began to use more precise educational psychology frameworks to deconstruct interest, distinguishing between situational interest triggered by specific environments and stable individual interest, and exploring their dynamic transformation mechanisms (Gao, 2017). Second, the value orientation was enhanced. With the rise of the "core literacy" concept, sports interest was no longer just an emotional experience or teaching tool but was defined as an essential element of "core literacy in physical education" and became one of the core goals of physical education. Finally, the practice orientation became more explicit. Against the backdrop of declining student physical health, the sports curriculum's choice of health-oriented course goals was particularly crucial. The close link between "physical health" and interest was repeatedly mentioned (Jiang, 2016). Sports interest was empirically regarded as the "key intermediary variable" for solving the problem of declining youth physical health and ensuring the long-term effectiveness of physical education courses, with its strategic position becoming increasingly prominent.

By the 2020s (2020-2025), research onsports interest entered a stage of deep integration of technology empowerment and model innovation. The trends in this period showed three expansions: First, the cutting-edge integration of interest and technology, with keywords such as "educational digitalization" (Qing, 2023) and "intelligent technology" indicating that the research frontier has extended to fields such as virtual reality, intelligent wearable devices, and sports apps, aiming to precisely stimulate, monitor, and maintain students' interest through technological means. Second, the dual drive of interest and health, with research dedicated to building a virtuous cycle of "interest—participation—health," emphasizing that interest is not only the psychological motivation for immediate participation but also the "internal safeguard" for maintaining a long-term healthy lifestyle. Third, the model innovation of interest and curriculum, with new curriculum models such as "class rotation system" (Wang, 2023), "large unit teaching" (Mao, 2024), and "happy sports" (Yu, 2022) becoming important carriers for exploring interest cultivation. This indicates that the issue of interest has risen from the level of teaching methods to the top-level design of curriculum structure and educational system, aiming to provide students with a more personalized and attractive sports education experience through systemic reforms.

6.Conclusion and Future Directions

The annual publication volume in the field of sports interest shows an overall downward trend, with low and highly dispersed cooperation between authors and institutions.

Future efforts should focus on further strengthening and improving exchanges and cooperation. Research in China's sports interest field mainly focuses on keywords such as "physical education," "school sports," and "interest."

Future research may continue to deepen the understanding of the mechanisms of interest generation under the background of the deep integration of digitalization and humanism and explore its effective pathways in promoting the comprehensive and lifelong development of young people in a broader educational ecology.

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