

Disciplinary Evolution, Knowledge Structure and Research Frontiers of Housing Satisfaction Research: A Bibliometric Study Using CiteSpace

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Abstract: While contributing to the advancements in this research field, the rapid increase in housing satisfaction research also poses challenges such as information overload and screening difficulties. When the user is limited by ability or energy, a biased entry point may be determined as a result. Utilizing bibliometric analysis method and CiteSpace software to examine articles in the Web of Science database, this paper comprehensively explores the evolution process, main research topics, key content, and current research hotspots in housing satisfaction research. The aim is to assist researchers, real estate practitioners and decision-makers in quickly and systematically grasping the evolution process, knowledge structure and development trend of housing satisfaction research topics. Results indicate that housing satisfaction is a comprehensive interdisciplinary topic with core content focused on analysing influencing factors across different types of housing and regions; exploring methods for studying these factors; and predicting behaviour based on results obtained. Currently, there is diversified distribution among areas of focus within this field; "mathematics, systems, mathematical" are a popular subject area, while structural equation modelling and social sustainability are hot topics. Future research endeavours can further explore the application of digital technology in studying housing satisfaction while considering the imperative of societal sustainability.

Keywords: Satisfaction; Housing Satisfaction; Bibliometric; Science Mapping; CiteSpace

1. Aims and Background

1.1. Aims of the Study

Scholars have conducted a series of studies on the influencing factors, evaluation methods, and behavioral prediction of housing satisfaction. While these studies have enriched academic outputs in this field, they also pose the risk of information overload and screening difficulties for application subjects. Even worse, due to constraints on capability and energy, biased citations of existing research findings commonly occur among end users. In response to this issue, this paper adopts a bibliometric approach to conduct a systematic analysis of housing satisfaction research literature indexed in Web of Science, aiming to help researchers, real estate practitioners and policymakers quickly grasp the evolution, knowledge structure and development trend of housing satisfaction research topics. This research addresses four research questions in sequence: What changes have occurred in the disciplinary affiliation of housing satisfaction research? What are the main categories of research topics on housing satisfaction? What are the key research focuses of housing satisfaction? What are the current research hotspots in the field of housing satisfaction?



1.2. Background of the Study

Bibliometrics is an interdisciplinary field that adopts methodologies from library science, informatics, mathematics and statistics to comprehensively analyze the quantity, patterns and trends of books, articles and other publications [1]. Owing to its unique advantages, bibliometrics has been widely applied in a broad range of domains, including medicine [2], education [3], finance [4], economics [5], agriculture [6] and mechanical engineering [7]. By conducting quantitative analysis on the characteristics of academic publications, it can reveal the development trajectories and structures of scientific research, and evaluate the influence of research outputs and academic achievements [8]. Two fundamental prerequisites are required for the application of bibliometrics: the availability of bibliometric software and the accessibility of scientific databases [9]. The emergence of tools such as Gephi, CiteSpace, and VOS viewer, as well as the open accessibility of scientific databases including Scopus and Web of Science, has created uniquely favorable conditions for the promotion and application of bibliometrics.

2. Experimental Part

In the conduct of bibliometric inquiries, the triad of core strategies delineated below is pivotal to the integrity and excellence of the research outcomes [10-12].

2.1. Data Search Strategies

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines are extensively employed as authoritative references for literature reviews across diverse academic disciplines [11]. In adherence to these guidelines, this study pursues an evidence-based and rigorous approach.

2.1.1. Basic Information Regarding Data Retrieval

This study adopts the co-citation analysis method [13]. To avoid manual data integration errors [10], literature searches are restricted to Web of Science, focusing on its core datasets: SCI-EXPANDED (1970-present), SSCI (1970-present) and ESCI (2005-present). Data collection procedures are shown in Figure 1. English articles published from 1970 to present, with topics covering "housing satisfaction" and its equivalents, are included.

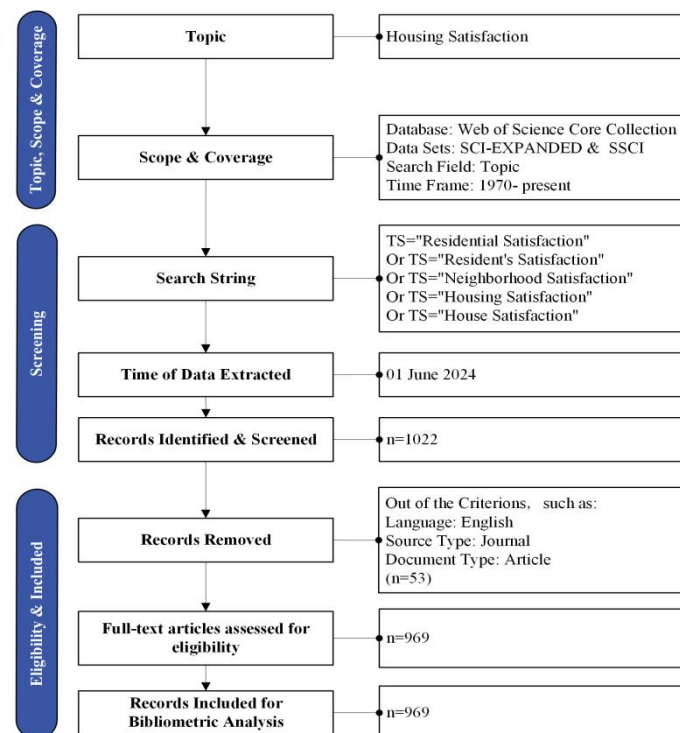


Figure 1. Flow Diagram of Data Collection

2.1.2. Execution of Data Collection

Drawing upon the document extraction technique employed by Emami and Sadeghloou (2021), this investigation retrieved literature encapsulating such noun phrases as housing satisfaction, resident satisfaction, community satisfaction, and alike, within the article titles [13]. The data extraction process was conducted on June 1st, 2024. Within the aforementioned dataset, this study initially gathered 1022 data entries.

2.1.3 Methods of Data Purification

Data purification follows inclusion and exclusion criteria [14]. This study only includes original peer-reviewed articles on housing satisfaction, excluding conference abstracts, errata, reviews, notices, promotional materials, and duplicate literature [14-15]. Redundancy was eliminated in the retrieval design, rendering duplicate processing unnecessary. After purification, 969 valid entries were obtained for analysis, with details in Table 1.

Table 1. The Details of Data Cleaning

Document Type	Total Publications	Exclusion (Yes/No)	Number of Inclusion
Article	930	No	930
Article; Data Pape	1	No	1
Article; Early Access	20	No	20
Article; Proceedings Paper	18	No	18
Book Review	15	Yes	0
Correction	1	Yes	0
Meeting Abstract	10	Yes	0
Note	2	Yes	0
Review	25	Yes	0

Source: Authors' Creation.

2.2. Strategy of Data Analysis

Per Donthu et al. (2021), bibliometric methods fall into performance evaluation and science mapping, with the latter focusing on interrelationships between research elements [10]. This study adopts science mapping to explore the evolution, themes, focus areas and emerging trends of housing satisfaction research. CiteSpace is chosen for its strengths in visualizing latent knowledge, research trajectories and disciplinary structures [16], with proven bibliometric visualization superiority [15]. Specifically, CiteSpace 6.3.R3's dual-map overlay analysis [17] and co-word analysis [18] are employed to analyze paper distribution, citation dynamics and field hotspots respectively.

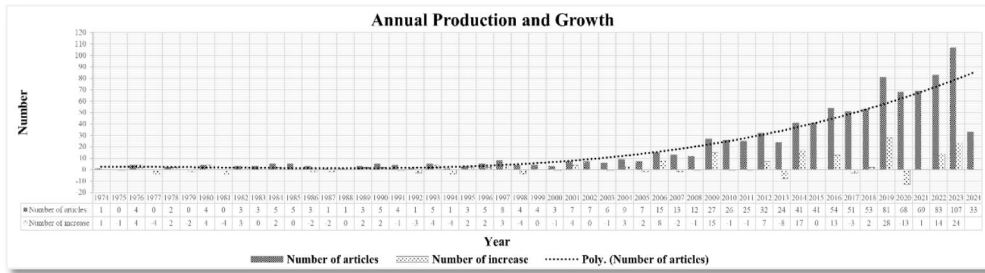
2.3. Interpretation Strategy of Analysis Results

There are two primary interpretation approaches established. The first is the journal dual-map overlay analysis, whose visualization results consist of a citing map on the left and a cited map on the right [18]. The connecting curves between the two maps are citation links, which are used to demonstrate the flow and context of literature citation. The second approach is co-word analysis. According to the source of analysis units, this method is generally divided into three categories: domain (discipline) co-occurrence, term co-occurrence and keyword co-occurrence, and only the latter two are involved in this study. Through time trend detection, burstness detection and network clustering of keywords and terms, the knowledge structure, evolution trend and cutting-edge hotspots of research topics can be effectively revealed. The clustering effect is measured by two indicators: Modularity and Silhouette.

3. Results and Discussion

3.1. Time Distribution of Housing Satisfaction Research

Figure 2 shows the publication timeline of housing satisfaction studies, with an overall upward trend in annual output. The field's development falls into two phases: 1974-2005 saw annual publications never exceed 10, reflecting insufficient research depth and intensity. The 2006-present phase (excluding 2024 data) records 12-107 annual publications, averaging around 46. Though annual output dips occasionally, growth remains dominant, with surges of over 20 in 2019 and 2023, and increments exceeding 10 in 2009, 2014, 2016 and 2022.



Note: The data of 2024 in the figure is only collected until June 1, 2024, so the calculation and drawing of the growth amount are not done.

Figure 2. Trend of publication

3.2. The Historical Evolution of Housing Satisfaction Research

Disciplines inevitably evolve from nascence to maturity and eventual replacement by emergent fields. This paper explores the knowledge structure trajectory of housing satisfaction research via the dual-map overlay analysis results presented in Figure 3.

Current housing satisfaction research, as shown by the left ellipse in Figure 3, is predominantly clustered in "Economics, Economic, Political" and "Psychology, Education, Health" disciplines, with secondary presence in "Medicine, Medical, Clinical", "Ecology, Earth, Marine" and "Mathematics, Systems, Mathematical" fields. Literature in "Physics, Materials, Chemistry" and "Veterinary, Animal, Science" remains scarce. The ellipse's elongated major axis indicates the number of researchers in this field far exceeds published documents, reflecting a large research community.

The right ellipse reveals that cited literature mainly originates from "Psychology, Education, Social Sciences", "Economics, Political Science" and "Health, Nursing, Medicine", with notable contributions from "Environmental Sciences, Toxicology, Nutrition", "Earth Sciences, Geology, Geophysics", "Mathematics, Mechanical Engineering" and "Systems Science, Computing, Computer Science".

The intensity and width of the citation curves indicate that most existing studies are concentrated in the fields of "Economics, Economy and Politics", "Psychology, Education and Health", and draw on research outcomes from "Psychology, Education and Society", "Economics, Economy and Politics", as well as "Health, Nursing and Medicine".

The tonal distribution of the citation curves reflects the evolutionary process of this field: it originated in the field of "Ecology, Earth and Marine Science", and gradually incorporated research methodologies from "Psychology, Education and Society" and "Economics, Economy and Politics" afterward. With the deepening of research, the "Medicine, Healthcare and Clinical" field has gradually become involved, and achievements in "Health, Nursing and Medicine" have also been absorbed. At present, "Psychology, Education and Society" and "Economics, Economy and Politics" have become the core domains, which continuously improve the knowledge framework of this field through integrating interdisciplinary insights, and cutting-edge research has extended to the field of "Mathematics, System Science and Mathematical Science".

Despite the interdisciplinary integration in its formative process, housing satisfaction research remains primarily a compilation of existing disciplinary knowledge, and has not yet established an independent disciplinary development trajectory.

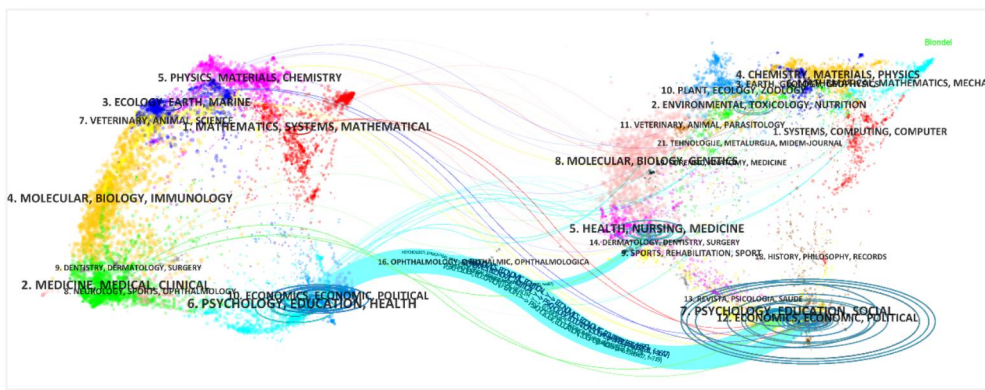


Figure 3. The dual-map overlay with links bundled by z-scores

3.3. Knowledge Structure Analysis of Housing Satisfaction Research

The co-occurrence analysis diagram shown in Figure 4 is generated after extracting noun phrases from the titles, abstracts and keywords of academic literature related to housing satisfaction. Word frequency statistics are then conducted to reveal the distribution characteristics and main themes of terms in housing satisfaction research, and outline the inherent knowledge structure.

Analysis of the text information associated with each node in Figure 4 shows that there are 1068 noun phrases in this field. The third column of Table 2 lists the ten terms with the highest occurrence frequency. In Figure 4, some nodes are filled in red, indicating that the number of publications on specific topics has increased significantly within a short period [15].

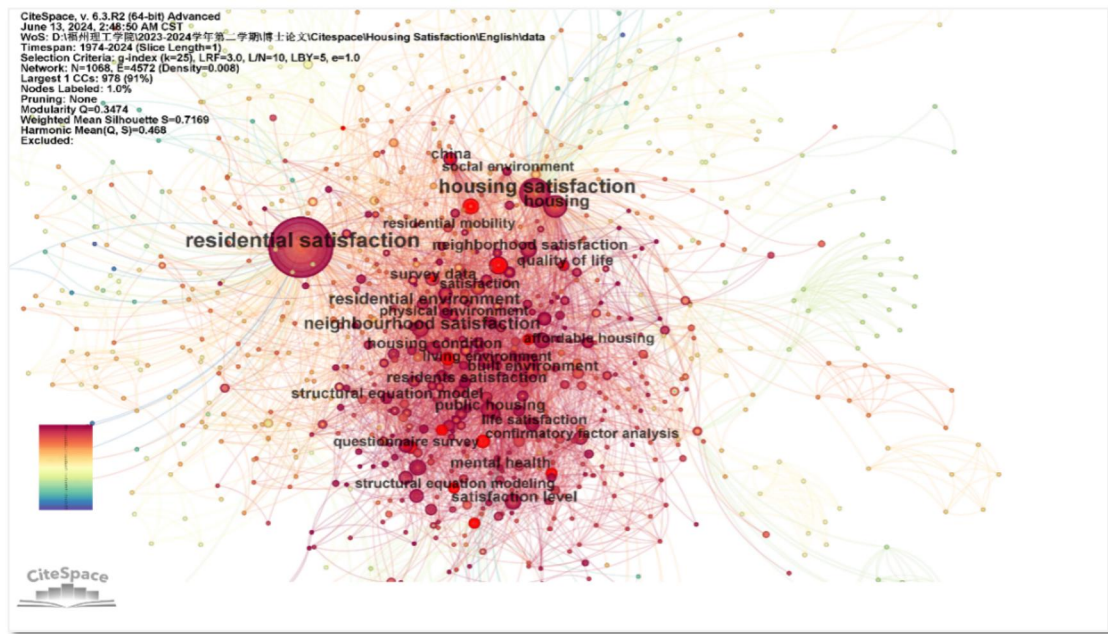


Figure 4. The Co-occurring Terms map

Table 2. Top 10 terms and keywords for housing satisfaction research

No	Count (Terms)	Terms (Noun phrases)	Count (Keywords)	Keywords
1	431	residential satisfaction	514	residential satisfaction
2	183	housing satisfaction	175	determinants
3	76	neighborhood satisfaction	123	quality of life
4	61	housing	117	city
5	53	residential environment	102	health
6	44	neighborhood satisfaction	89	housing satisfaction
7	43	China	88	community
8	40	questionnaire survey	85	mobility
9	40	residents' satisfaction	80	environment
10	38	quality of life	74	quality

Figure 5 presents the statistical results of emerging themes. As shown in Figure 5, multiple themes have emerged in the field of housing satisfaction research, ranging from early-stage American housing survey and residential mobility to neighborhood satisfaction. Subsequently, in the medium-term stage, the research focus shifted to household surveys and community environments in Chinese cities. Currently, the most relevant themes include practical application implications, structural equation modeling, and social sustainability, which cover research regions, behavioral prediction, research methods and influencing factors.

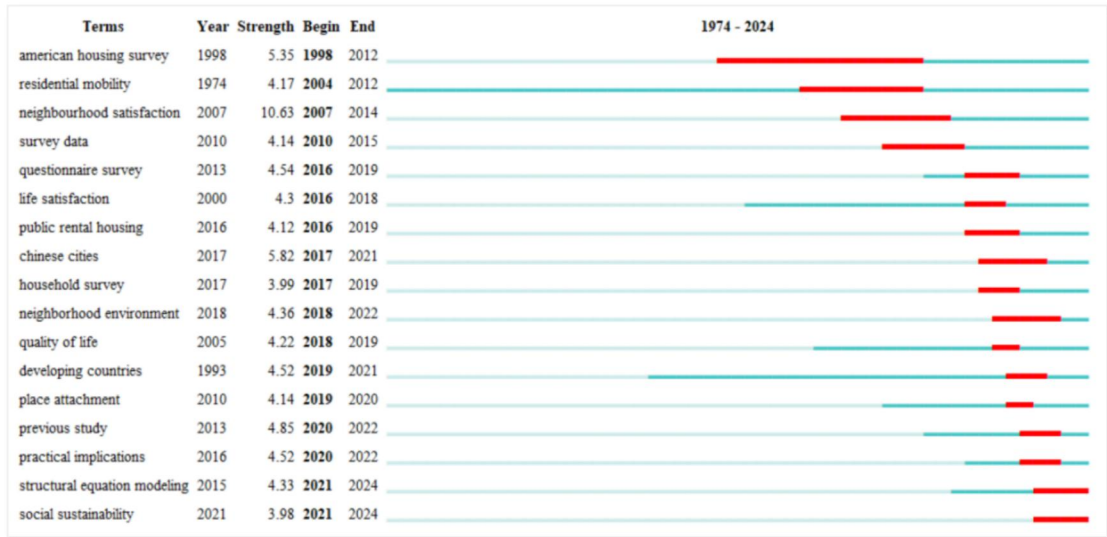


Figure 5. The Top 17 Terms with the Strongest Citation Bursts ($\gamma=1$, Minimum Duration=2)

Through cluster analysis of all research terms (emerging factors are not considered, see Figure 6: modularity $Q = 0.6171$; weighted average silhouette coefficient = 0.8232; minimum silhouette coefficient = 0.636), it can be found that most research themes related to housing satisfaction are centered on parameters such as research regions, research methods, influencing factors and behavioral prediction. For example, as shown in Figure 6, the clusters corresponding to codes 0, 2 and 19 are subdivisions of the overall research theme of housing satisfaction, while the cluster corresponding to code 4 involves housing types. All other clusters can be classified into the above categories. Notably, the clusters coded 1 and 11 were merged during the clustering process, forming an innovative method in this research field. The clusters corresponding to codes 3, 7, 9, 12, 13, 15, 16 and 17 belong to studies exploring the influencing factors of housing satisfaction; the clusters coded 5 and 8 focus on methodological issues; while the clusters corresponding to codes 6, 10 and 14 cover predictive analysis of behavioral outcomes.

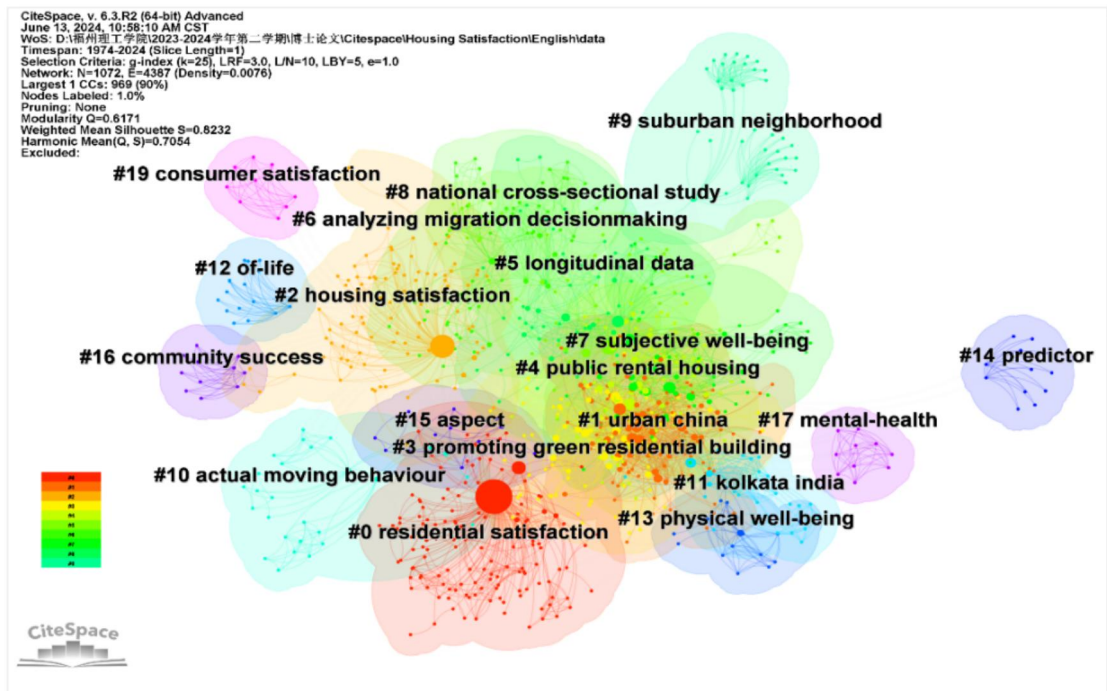


Figure 6. The Clusters of Terms about Housing Satisfaction Research

4. Conclusions

This study uses CiteSpace to synthesize 969 Web of Science documents, mapping the disciplinary trajectory, cognitive framework, core focuses, and emerging trends of housing satisfaction research.

Findings show publication volume has grown steadily since 1974, with a sharp rise post-2006 and peak outputs in 2019 and 2023. An interdisciplinary field, housing satisfaction evolved from "Ecology, Earth, Marine" through "Medicine, Medical, Clinical" to its current core drivers: "Psychology, Education, Social" and "Economics, Economic, Political".

Cluster analysis places primary emphasis on empirical work concerning determinants and methodological approaches across contexts, with behavioural prediction as a secondary concern. Current leading topics—structural equation modelling and social sustainability—are frequently published in journals classified under "Mathematics, Systems, Mathematical." "Neighbourhood attachment" remained a frontier term until 2020; since then, the field has become more fragmented despite an increase in publication numbers.

At present, the trend is toward quantitative studies that leverage digital and big-data technologies within a social sustainability framework, although this subarea remains under-represented in the literature. Future investigations could harness AI and digital tools to achieve more objective measurements of subjective satisfaction. On a methodological note, reliance on CiteSpace and restriction to the Web of Science core collections (SCI-EXPANDED, SSCI, ESCI) may omit relevant non-indexed or non-English works, thereby limiting the generalisability of the results.

Funding

Funding from Fuzhou Institute of Technology (FIT) under Grant No FTKY202304.

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