



A bibliometric visualisation of CNKI-based visual metaphor studies

Dinghui Ma

Nanjing University of Science and Technology, School of Design, Art and Media, Nanjing
210094, Jiangsu Province, China

Author email: 19315548313@163.com.

Abstract. To conduct a visual analysis of the literature related to visual metaphor research and to analyze the research status and development changes of visual metaphor research in China in the past 23 years. Using bibliometric methods and CiteSpace software to map the knowledge of 408 pieces of visual metaphor-related literature in the CNKI Chinese Journal Database from 2000 to 2023, we explored the cutting-edge hotspots and research trends of visual metaphor in China over the past twenty-two years from the perspectives of research institutions, authors and keywords. Visual metaphor research institutions are mainly concentrated in universities, with the majority of liberal arts and fine arts colleges and universities; Inter-author cooperation is primarily a group collaboration with a mentor at the center; The research hotspot of the integration and penetration of the visual metaphor theory system and the design industry has been further strengthened, the attention of the research on visual metaphor and visual culture has continued to increase, and the technological intervention of the research on visual metaphor methodology has been more and more prominent; The future development focuses on interdisciplinary communication, based on the search for diversified and innovative localized modes of visual metaphor development.

Keywords: visual metaphor, CiteSpace, visual analysis

1 Introduction

Visual metaphors are commonly used in literature, art, and advertising to enhance the expressiveness and appeal of narratives, covering understanding and analyzing metaphors conveyed through visual elements, which include images, diagrams, logos, advertisements, artwork, and other visual elements. The study of visual metaphor covers many different fields, from psychology to cultural studies to art and media. It has important implications for our understanding and application of visual elements to convey information and emotion. Using bibliometric methods and CiteSpace software to analyze the knowledge of 408 visual metaphor-related literatures in CNKI Chinese Journal Database from 2000 to 2023, this paper explores the cutting-edge hotspots

and research trends of visual metaphor research in China in the past 22 years from the perspectives of research institutions, authors and keywords.

2 Research Methodology and Literature Statistics

2.1 Bibliometric methodology

2.1.1 Overview of bibliometric methods

Bibliometrics is a method for studying the quantity and quality of scientific literature. It assesses the impact of scientific research, trends in development and the scale of academic activities, etc., by analyzing the quantity of literature, citation relationships and other relevant indicators. Bibliometrics can be applied to a variety of subject areas, including the natural sciences, social sciences and humanities. The underlying assumption of bibliometrics is that the output of scientific research can be measured by the number of documents and citations. Among them, the indicators of literature quantity include the number of articles published, the number of authors, the number of journals, etc.; the indicators of citation relationship include the frequency of citations, the number of authors cited, the number of journals cited, etc. Through the quantitative analysis of these indicators, we can understand the development trend of scientific research, hot issues in subject areas, and the cooperation network of academic groups and other information. Common indicators of bibliometric methods include:

1) Literature output indicators: e.g., number of articles published, number of authors, number of journals, etc., reflecting the activity and scale of scientific research.

2) Citation indicators: such as citation frequency, number of authors cited, number of journals cited, etc., reflecting the influence and citation relationship of scientific research.

3) Indicators of academic cooperation: e.g., number of co-authors, analysis of cooperative networks, etc., reflecting the cooperative relationships and modes of cooperation of academic groups.

4) Discipline development indicators: such as citation network analysis, theme evolution analysis, etc., reflecting the research hotspots and development trends in the discipline areas.

2.1.2 Advantages of bibliometrics for literature analysis

Bibliometrics uses quantitative methods to collect and analyze literature and helps to reduce the influence of subjectivity and personal preferences on results. Through the use of statistical and econometric methods, the volume of literature and related indicators can be translated into numbers, making the results of research more objective and quantifiable. Bibliometrics can handle large-scale literature datasets that include thousands or more documents. This capability allows researchers to obtain broader coverage of the literature and capture a more comprehensive picture of academic developments and trends. Through bibliometric methods, citation

relationships, thematic evolution, and collaborative networks of the literature can be analyzed, thus revealing the hot issues and trends of academic research. This helps researchers to understand the cutting-edge progress in specific fields and provides guidance for further research and decision-making. Bibliometrics can assess the impact of academic literature through indicators such as citation frequency and cited frequency. These indicators can be used to assess the academic reputation and contribution of scholars, journals, organizations, etc., and help researchers in their research assessment and decision-making.

2.2 Data source

CNKI Chinese Journal Database contains a large number of Chinese journals covering a wide range of subject areas, including natural sciences, social sciences and humanities. This allows bibliometrics to access a wealth of Chinese literature resources, especially those research results published in China. The journal literature in the CNKI database served as the primary data source for conducting econometric analyses. The selection of journal literature was limited to the following three types of inclusion: Chinese Core Journal Abstracts (Peking et al.), Chinese Humanities and Social Sciences Core Journal Abstracts (CSSCI), and Chinese Science Citation Database (CSCD), with no time limit [1]. Firstly, the research literature on "visual metaphor" was pre-searched with multiple combinations of titles, topics, excerpts, keywords, etc., to test and compare the completeness and validity of the data of various search results. A total of 773 pieces of literature were acquired. Three hundred fifty-six articles with a low degree of relevance to this study were manually eliminated (including the introduction of institutions or disciplines, exhibitions or conference forums, graduation design presentations and work displays, magazine feature preambles, chemical and materials science research, and so on.), and 408 valid papers were obtained, with the final update of the literature search on 14th April 2023, establishing 408 documents as the data for analysis.

2.3 Bibliometric tool

2.3.1 Overview of VOSviewer

It draws on the methodology used in econometric analyses of studies already in the literature. VOSviewer (version 1.6.16) and CiteSpace (version 5.8.R3) are used as the leading software to calculate and present the literature data of visual metaphors for metrological visualization, and based on which they are interpreted and discussed further to form a valuable research theory. Based on the JAVA language, VOSviewer and CiteSpace are now widely used academic analysis software worldwide. Among them, VOSviewer has functions that can be used for collaborative network analysis, keyword co-occurrence analysis, citation analysis, literature coupling analysis, and co-citation analysis of literature [2], as shown in Figure 1. CiteSpace is software that, in addition to the central analytical functions of VOSviewer, can present the dynamics of crucial information trends through time slicing. In a nutshell, the advantageous logic of this two literature analysis software lies in the ability to discover and mine

potential patterns and information in literature data by calculating bibliometric relationships. Combining two analysis software for this study to visualize and analyze the screened literature can reduce the distortion and bias caused by subjective information filtering choices. It can provide a more transparent and efficient grasp of the research hotspots and trends in visual metaphors[3].

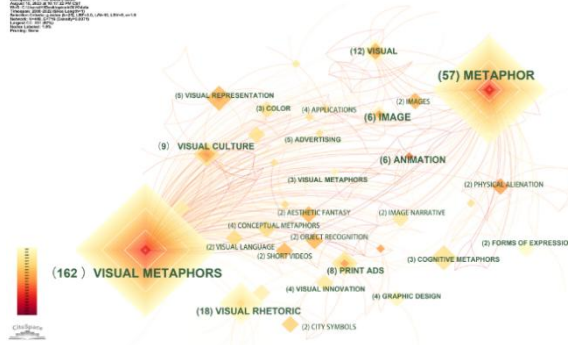


Fig. 1. Keyword co-occurrence mapping

2.3.2 Advantages of VOSviewer in Bibliometrics

VOSviewer has an intuitive, user-friendly interface design that makes it easy for researchers to use the tool for bibliometric analysis. Its graphical interface and interactive operation enable researchers to quickly get started with data import, parameter setting and result visualization. VOSviewer can transform bibliometric data into visual graphics, such as co-citation network diagrams and topic maps. Through visual analysis, researchers can more intuitively understand the relationship between the literature, the distribution of hot issues, and the trend of disciplinary development. This helps provide a clear visual presentation and helps researchers gain quick insight into the results of bibliometric analysis. Meanwhile, VOSviewer provides rich analysis functions, such as co-occurrence analysis, cooperative network analysis, and thematic evolution analysis of literature. Researchers can choose different analysis methods according to their own needs, so as to deeply explore the valuable information in the literature data. The ease of use and flexibility of these functions enable researchers to conduct in-depth bibliometric analysis according to specific research purposes.

3 Bibliometric analysis

3.1 Analysis of the current status of research in the issuing institutions

Visual analyses of bibliometric results from research institutes related to visual metaphors provide insights into the state of research in visual metaphors and an understanding of the state of collaboration within the industry. The visual metaphor research literature in the country from 2000-2023 comes from 214 organizations. The nodes are discretely distributed, indicating a relatively disconnected and less

collaborative nature among the organizations, as depicted in Figure 2. Research institutions primarily concentrate within universities, particularly liberal arts and fine arts colleges. According to statistics, the top ten research institutions in China all belong to higher education establishments with exceptional expertise in visual metaphor, five of which are affiliated with teacher training universities. According to the statistics, the top ten research institutions are all institutions of higher learning with outstanding levels of expertise in visual metaphor in China, five of which belong to teacher training universities. The primary focus of research institutions lies within universities, predominantly encompassing colleges and universities specializing in arts and humanities. The data show that there is very little literature from research organizations originating from businesses, and no government organizations are in the top ten issuing organizations.

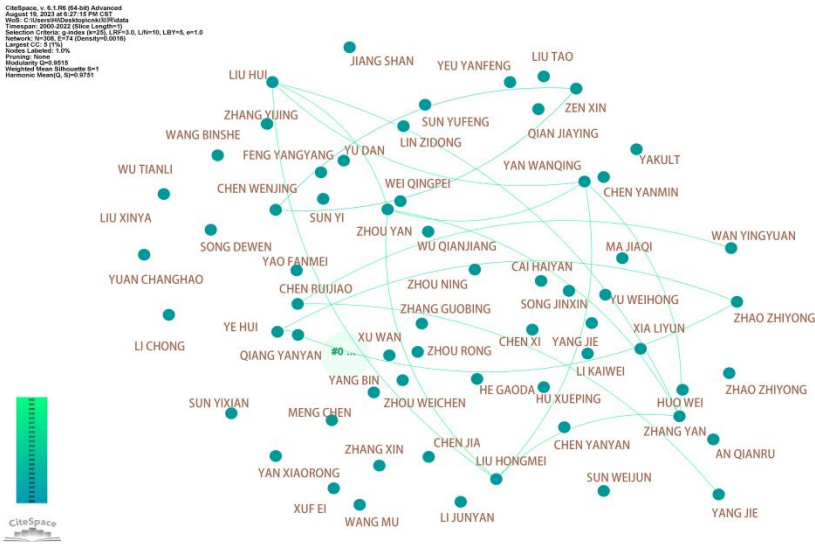


Fig. 2. Mapping of authors' institutional relationships in the field of visual metaphor research

3.2 Analysis of co-operative networks of authors of publications

The analysis of author collaborations provides insights into the distribution of leading scholars and their influence, as well as key findings on visual metaphors. The data was imported into CiteSpace software to analyze influential collaborations between authors. Set the node type to the author and the time interval to 2000-2023 to output the author collaboration network map, see Figure 3. Thicker lines represent more collaborations. The color of the connecting line corresponds to when the authors collaborated. For example, purple indicates that the authors 2016-2023 established the collaboration in 2016. The sample contains 267 nodes representing 267 authors, the number of connections between nodes is 69, and the density of the collaborative network is 0.0019. The data suggest a low concentration of collaborative relationships

among visual metaphor researchers in China. As can be seen from the authors' collaborative relationship mapping (see Figure 3), authors mainly collaborate on a team basis. A certain number of collaborative clusters have formed across the country, usually with authoritative scholars and supervisors with strong influence in the field of visual metaphor at the center of the collaborative network; however, team-to-team collaboration is not close, and scholars from the same institution collaborate, and research relationships between the researcher and other teams are relatively dispersed. The results of the above analyses, combined with the mapping data, show a low level of collaborative concentration among visual metaphor researchers. This is because the discipline of visual metaphor is in a late stage of development in China, and extensive inter-institutional cooperation has yet to be established, resulting in discrete and infrequent collaborative networks among visual metaphor scholars. As the study of visual metaphors matures, there will be an increase in networked collaboration among authors across teams and institutions, resulting in a national system for the study of visual metaphors.

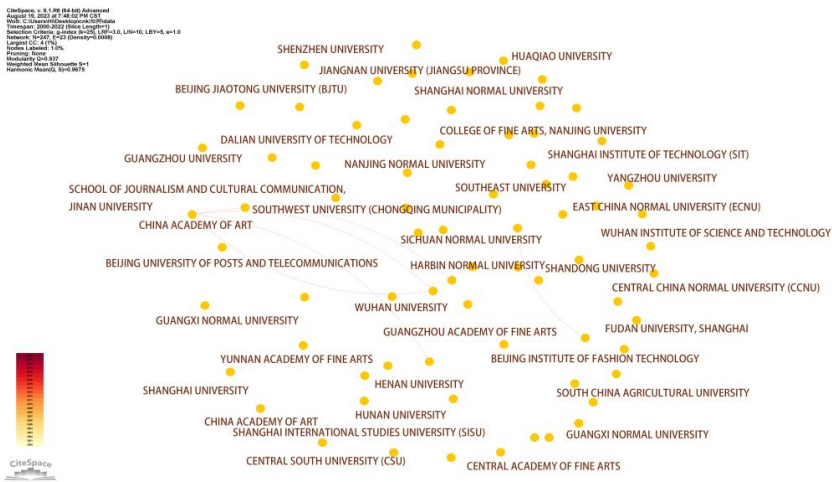


Fig. 3. Mapping of author collaborations in the field of visual metaphor research

3.3 Literature Characterisation Statistics

The number of publications in the visual metaphor literature is not only a reflection of the continuity and interest in the research, but its analysis can also reflect the speed and characteristics of the research development in the time dimension. Secondly, the volume of publications can effectively analyze the research dynamics of visual metaphors and provide quantitative data elements to support subsequent research. The distribution of annual publications in the visual metaphor literature is shown in Figure 4, with each stage of literature publication characterized by distinctive features. The distribution of annual publications in the visual metaphor literature is shown in Figure 4, with each stage of literature publication characterized by distinctive features. This

shows that since 1996, publications on visual metaphors have gone through three stages of development similar to "slow start - steady development - vigorous expansion."2006-2011 was a start-up period, with a single-digit average number of publications per year, including five in 2006 and five in 2010. The years 2012-2017 were in a period of development, and all of them have remained at more than 13 publications per year since 2014, showing a steady state of development. Beginning in 2018 in a booming state, from 2018 onwards, the average number of literature published each year reached only 20, of which the number of publications reached more than 33 in 2022, showing a rapid growth trend. From the statistics of the number of articles published, the study of visual metaphor has gradually become a hot topic of scholars' attention, and its degree of attention has been increasing yearly.

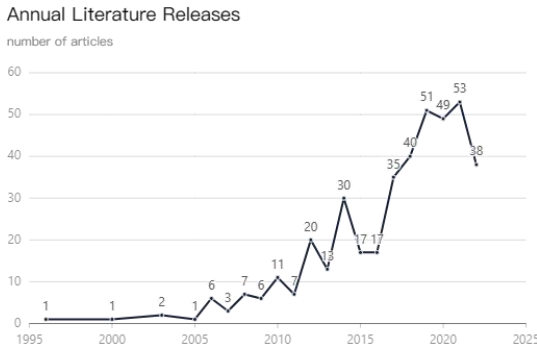


Fig. 4. Trend chart of the number of publications in the visual metaphor literature

4 Hot Topics in Keyword Co-occurrence Cluster Analysis Research

Keywords are vital terms that reflect the theme, content, ideas, and research methodology of the visual metaphor literature and are distilled to a high level from the literature study, which is a crucial indicator content of the informetrics study. Metric clustering analysis of keywords in visual metaphor literature can visually present its research hotspots.VOSviewer was applied to analyze the keyword co-occurrence of 408 documents to form a visual map of keyword co-occurrence clustering.The number of network nodes is 449 and the number of connections is 716. On this basis, combined with an in-depth study of the literature, we can summarise the studies with the highest co-occurrence clustering of visual metaphor keywords into five hot topics : #1 Metaphor - Theoretical Concepts of Visual Metaphor, #2 Visual Rhetoric - Morphological Approaches to the Practice of Visual Metaphor, #3 Vision - Typological Mediums of Practice of Visual Metaphor, #4 Graphic Design - Approach Paths to Visual Metaphor, as shown in figures 5. Taking visual mapping as a clue, the research analysis of these five thematic co-occurrence clusters can portray and interpret the research hotspots of visual metaphors in an in-depth manner.

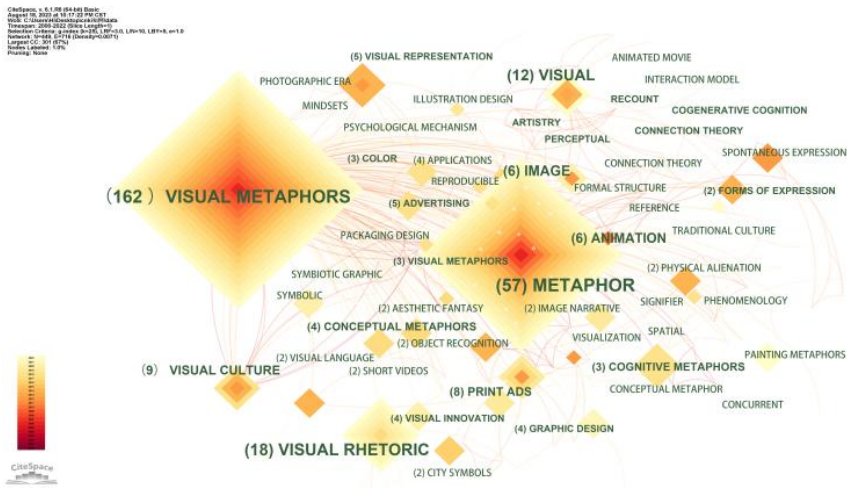


Fig. 5. Co-occurrence mapping of keywords in visual metaphor research

4.1 Visual Metaphor - Theoretical Concepts of Visual Metaphor

The clustering connection strength of this theme is 143, which mainly contains keywords such as spatial design, the spirit of writing, application strategy, ad hoc category, object recognition, perceptual similarity, display space, and coupling development. Many researchers regard the theory of visual metaphor as the logical origin and theoretical basis of visual metaphor. As an ancient way of thinking about human beings, metaphor occupies an essential position in human language, thought, and culture and different types of metaphors have different functions[6]. The visual metaphor is relative to verbal metaphor; metaphor in visual art is the use of visual language for the conversion of the connotative meaning between things, and this conversion is through the re-modeling of visual symbols to achieve the interpretation of meaning[7]. Guo Wei points out that abstraction is the ability of visual perception to play the function of similarity fusion, visual thinking to realize the function of similarity highlighting, and the ability to present visual metaphors by generating perceptual imagery or imagery schema, which is not only the attribute of thinking but also the essential feature of artistic, creative activities and artistic operations[9]. From the methodological perspective, taking the theory of symbolic meaning generation as the origin, it is proposed that visual metaphors are formed by substituting symbols on the aggregated segments with each other, and there are three modes of symbolic combinations: integration of ontology into metaphor, integration of metaphor into ontology, and integration of ontology and metaphor into each other[4].

4.2 Metaphors - Representations of Visual Metaphorical Practices

The clustering connection strength of this theme is 47, and the hot keywords mainly contain the keywords of spatial metaphor, contemporary painting, transformation mechanism, microcosm, domain array, image referencing, visual metaphors, visual rhetoric, instructional metaphors, conceptual metaphors, so on. In the 1970s and 1980s, the concept of metaphor was widely concerned by philosophers, linguists, and psychologists, and metaphor was regarded as a linguistic device in cognitive linguistics. In contrast, in the contemporary academic world, the study of metaphor has transcended the scope of language and has been involved in various fields, such as art and psychology[10].

Metaphor is an important cognitive phenomenon that systematically maps one conceptual domain to another through human cognition and reasoning. Empathy is also a metaphor whose source and destination domains are human sensations. Visual metaphors project visual perception from the purely visual sphere based on bodily experience to the non-visual sphere of abstract thought, reflecting the projection from the concrete cognitive domain to the abstract cognitive domain[11]. Throughout the process of artistic development, the artistic creation of a variety of means of expression, in these many paintings in the performance of the metaphorical art rhetorical techniques to enrich the meaning of artistic creation so that the picture embodies the effect of a richer, more fully express the author's inner feelings of experience. Throughout the process of artistic development, the artistic creation of a variety of means of expression, in these many paintings in the performance of the metaphorical art rhetorical techniques to enrich the meaning of artistic creation so that the picture embodies the effect of a richer, more fully express the author's inner feelings of experience[12]. Li Shuhui points out the traditional metaphor, a literary, rhetorical device that uses one thing to allude to another, i.e., a way of feeling or imagining things of the other kind under the suggestion of such things. Visual metaphor in art design is a creative art form in which designers implicitly and subtly express their thoughts, emotions, and conceptual awareness, presenting a rich, multiple world of meaning to the audience while achieving a high degree of freedom in design thinking and new dimensions of visual expression[13]. Metaphor, as a way of cognition, is prevalent in people's daily life, and one of the most creative forms of expression for TV commercials is metaphor[14]. Researchers have attempted to apply metaphor as a method of creative thinking and design in art.

4.3 Visual Rhetoric - A Typological Medium of Practice for Visual Metaphors

The cluster has a thematic connection strength of 18 and contains the keywords visual communication design, visual metaphor, visual framing, visual symbols, cognitive metaphor, multimodal teaching, visual framing, and visual symbols. The concept of visual rhetoric was first introduced by French literary theorist and critic Roland Barthes in the 1960s to analyze the persuasive power of images in advertising[15]. Nevertheless, it was after W.J.T. Mitchell's "image turn" that visual rhetoric flourished[16]. More and more people are aware of the importance of images in

information dissemination and reception, and visual rhetoric is gradually becoming an essential part of visual studies and rhetorical research. Researchers of visual rhetoric agree that visual signs are inherently rhetorical[17]. Visual symbols are rhetorical; visual rhetoric is a research perspective that reveals this rhetorical nature[18]. Chen Ruijiao believes that urban visual symbols contain the historical memory of the city, a community where reality and imagination are intertwined, and visual rhetoric is concerned with the implicit meaning of image information, which has become a tool and means of urban image media communication with its richness of expressiveness, interpretation, and performativity[19]. In the meaning mechanism of visual rhetoric, visual metaphors rely on the metonymic structure constituted by visual elements, and the production of metaphorical meanings is realized on the aggregated axis of the image text. The workings of visual metaphors can be differentiated into constitutive and conceptual visual metaphors based on the differences in how the ontology and the metaphor are "present"[12]. From these studies, it can be analyzed that visual rhetoric is a typified way of mediating the practice of visual metaphors.

4.4 Graphic Design - Artistic Design Forms of Visual Metaphors

The clustered theme connection strength is 8. The clustered keywords mainly contain book design, image age, philosophical novel, visual information, psychological mechanism, animation creation, animation performance, visual innovation, expression, graphic design, graphic language, graphic language, emotional resonance, visual innovation, and expression. Metaphor as a way of thinking has attracted much attention in sociology, literature, behavioral sciences, etc. With the arrival of the image age today, scholars have transferred the sight of metaphor research to design, and visual metaphor has become an essential factor in advertising communication[20]. A metaphor, traditionally, is a literary, rhetorical device in which one thing is used to allude to another, i.e., a way of feeling or imagining something of the other kind under the suggestion of such a thing. Visual metaphor in art design is a creative art form in which designers express their thoughts, emotions, and conceptual awareness implicitly and subtly, presenting a rich and multiple world of meaning to the audience while achieving a high degree of freedom in design thinking and a new dimension of visual expression[13]. The visual metaphor is an essential and common design tool in the creative process of posters, and the graphic creativity in metaphorical expression can make the poster images produce vivid visual representations and thus enhance the aesthetic interest[7]. Under the embellishment of metaphorical techniques, the graphic shows a new appearance of novelty and richness of connotation, and conveying information becomes more subtle and meaningful. There are four different categories of perceptual metaphors in graphic design: formal metaphors, object metaphors, emotional metaphors, and illuminating metaphors, respectively[8]. More and more scholars have shifted the sight of metaphor research to design, and visual metaphor has become an essential factor in art and design.

5 Keywords hotspot migration analysis research trends

The visual metaphor keyword co-occurrence clustering view analyzed by VOSviewer is shown in Figure 6, which can only show the overall research hotspots and cannot demonstrate the development and evolution of these hotspots over time, and the analyzed data is relatively static. Through the hotspot migration analysis, the development and change of keywords can be interpreted from the time dimension, which can dynamically present the development and evolution trend of domestic visual metaphor research hotspots.

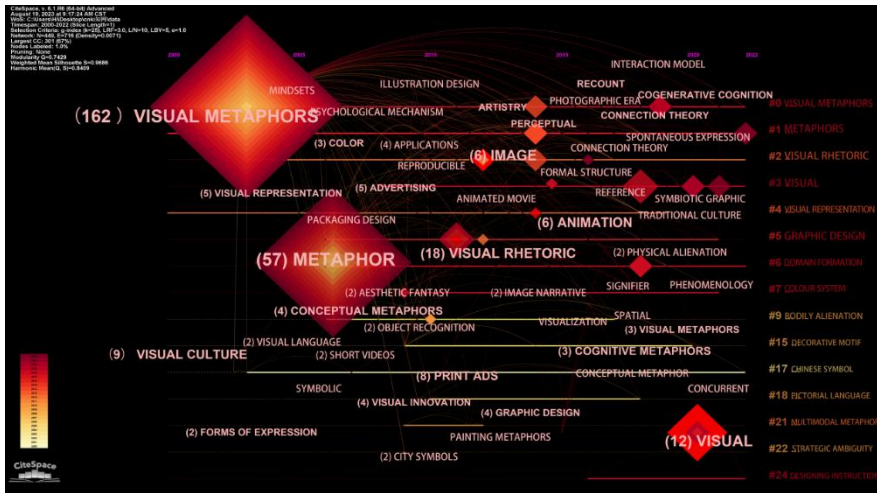


Fig. 6. Visual Metaphor Research Keyword Co-occurrence Time Mapping

5.1 Analysis of keyword emergence

The evolution of hotspots in visual metaphors from 2000-2023 is analyzed using the keyword emergence method. Mutation words describe specific terms appearing in the literature within a specific period. The Business function of CiteSpace software is used to draw a list of the top 25 keyword mutations in the study of visual metaphors, which contains the chronological distribution of the mutated words and the intensity of the mutations. It allows us to judge the field's research frontiers and development directions. As shown in Figure 8, the "occurrence time" at the top indicates the first occurrence of the keyword in the sample data. Two visual maps were obtained through the metrological analysis of the literature by CiteSpace software: Timeline and Keywords Bursts; see Figures 7 and 8 for details. Taking the mapping as the basis clue, combining with the previous literature feature statistics and hotspot analysis, and through the in-depth reading of related literature, this paper summarises the visual metaphor research into three stages: basic theory interpretation, application method construction, and diversified exploration. The later paper interprets and discusses them in turn.

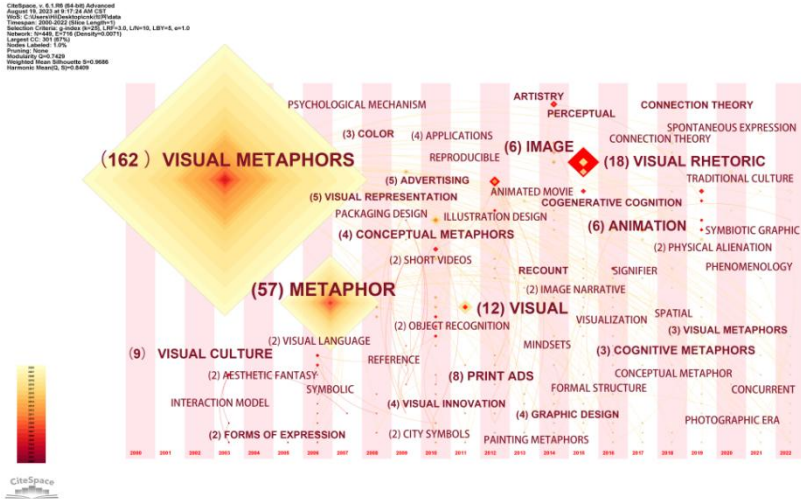


Fig. 7. Keywords timeline mapping

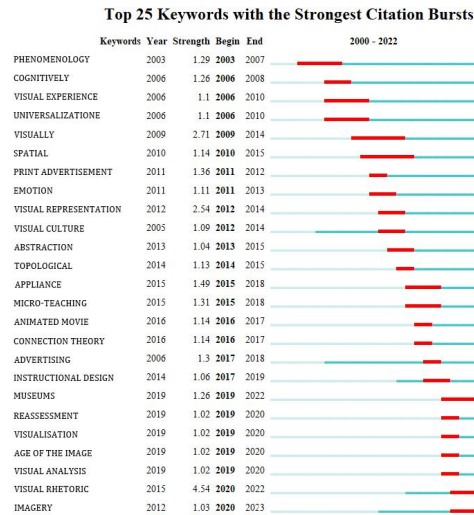


Fig. 8. Mapping of mutability keywords for visual metaphor research

5.2 Interpretation of developmental stages inductively

2003-2010: Grounded Theory Explanation This stage is the beginning of visual metaphor research. Keyword mutation phrases include phenomenology, Traditional metaphor theory, rediscovering and elaborating the meaning of "descriptive, comparative, associative"; the second is to sort out the western metaphor theory

research. However, these studies only treat metaphor as a category applicable to linguistics and literature.

2011-2018: Applied methodology construction, a period of steady development in studying visual metaphors. Keyword mutation phrases encompass visual rhetoric, association theory, emotion, image, and topological properties. Under the influence of the Western visual metaphor theory system, China's visual metaphor research has gradually focused on visual metaphor in specific art genres, analyzing metaphors in various films and television, stage, theatre, and advertisements and related issues. For example, based on the cognitive construction of advertisement consumption behavior, Cao Shuo identifies the cognitive processing process of advertisement visual metaphors and the four basic dimensions of consumption cognitive behavior (attention, memory, comprehension, and attitude) and carries out a study on the influence of advertisement visual metaphors on consumption cognitive behavior from the aspects of the cognitive processing process of advertisement visual metaphors, perceptual similarity, perceptual inconsistency, and textual references to clarify the preferred processing paths and conditions for the effect of consumption cognition of advertisement visual metaphors[20-21].

2018-2023: Diverse Explorations, a period of rapid growth in visual metaphor research, with keyword mutation phrases encompassing visual analytics, book design, image age, and film and television. The presentation of information using visual metaphors impacts consumer cognitive behavior, while visual metaphors can play a role in narrative techniques, color use, and styling. At this stage of development, visual metaphor research involves a variety of design topics, not only print, advertising, and other topics but also extends to spatial design, scene design, short videos, and book design. For example, the impact of visual metaphors of product packaging on consumer brand cognition is investigated, and the impact of packaging visual metaphors on brand cognition is elaborated, inspired by cross-channel consistency theory and judgment-inspired cognitive strategies. The visual metaphor of packaging has an essential impact on brand perception, and the study results are favorable for enterprises to pay attention to and explore the marketing value of packaging, which has a particular market value[5].

6 Discussions

Based on the above inductive interpretation of the developmental stages of visual metaphor research, it is found that there are some trends in the evolution of visual metaphor research that can be followed, which are further summarised in this paper as the following three clues: First, under the influence of Western aesthetic theory, the visual theory of modern aesthetics can be divided into two schools: the first is to inherit the traditional Chinese theory of metaphor, rediscovering and elaborating the significance of "descriptive, comparative, associative"; and the second is to sort out the research on the Western theory of metaphor. Secondly, domestic research on visual metaphor has gradually shifted from basic theory to focusing on specific art categories, analyzing visual metaphor's use and artistic value in film, dance, theatre,

advertising, animation design, etc. Third, visual metaphor research involves various design subjects, not only print, advertising, and other subjects, but also extends to spatial design, scene design, short videos, and book design, showing a comprehensive development trend.

Visual metaphors can make art and design more creative and unique. By linking different concepts together, designers can create compelling images and visual elements that catch the viewer's eye. Visual metaphors allow multiple levels of information to be embedded in a design, viewers can interpret more meaning and information from the images, this helps to deepen the interaction with the viewer, by associating abstract concepts with familiar images, the viewer is more likely to understand and remember the information. At the same time visual metaphors help convey emotion and emotional resonance. Designers can use metaphors to evoke an emotional response from the viewer, which strengthens the message and makes the design easier to remember. When viewers interact with visual metaphors, they are more likely to remember the images and the information contained within them because this connection to something familiar is more likely to stick in the memory.

7 Concluding remarks

Based on the metrological analysis of CNKI core journals on visual metaphor research, this paper focuses on the research's hot topics and development trends. It achieves a stage-by-stage general interpretation of the domestic visual metaphor research. The method based on econometric analysis enriches and expands the theoretical system and perspective of visual metaphor research and lays the data and theoretical foundation for further in-depth discussion in the future.

At the same time, this study continues beyond analyzing the measurement data of the visual metaphor literature. However, it uses the data as the basis for the clues to carry out in-depth theoretical thinking, experience, and constructs. It also depicts a visual mapping that can provide relevant researchers with a reference value for the overview and literature guide. The study of vision and visual culture in China did not start too late and has developed even more rapidly in recent years. Visual culture is the real-life form of visual metaphor in contemporary Western thought. In order to study visual metaphor, we should continue to fully inherit the existing research results at home and abroad and improve the development of the theory of visual metaphor in the new era with the relevant theories of art and aesthetics, comprehensively applying the analytical methods of iconography, rhetoric, and semiotics, and borrowing the theoretical achievements of linguistics, psychology, as well as structuralism and deconstructionism. However this study has the following limitations:

- 1) Bibliometrics relies on data from literature databases that may have data biases.
- 2) Bibliometrics focuses on the quantity of literature and citation relationships, but has relatively little in-depth understanding of the content of the literature.
- 3) VOSviewer's analysis results depend on the input data source.

4) The analysis results of VOSviewer are affected by parameter settings, such as keyword extraction, definition of collaborator relationship, etc. In future research, further consideration needs to be given to improve the appeal limitations.

References:

1. Rao CFY, Ni SongTao. China's industrial design research pathway based on CiteSpace bibliometric analysis (2016-2021)[J]. Packaging Engineering,2022,43(22):247-257.DOI:10.19554/j.cnki.1001-3563.2022.22.027.
2. Wang G,Li S,Zhang Z, et al. A Visual Knowledge Map Analysis of Cross-Border Agri-Food Supply Chain Research Based on CiteSpace[J]. Sustainability,2023,15(14).
3. Pan M,Zhang S. Visualization of Prediction Methods for Wildfire Modeling Using CiteSpace: A Bibliometric Analysis[J]. Atmosphere,2023,14(6).
4. Liang Jianfei. Visual runic system of print advertisement in the view of Pierce's category theory[J]. Packaging Engineering,2020,41(08):293-296.DOI:10.19554/j.cnki.1001-3563.2020.08.046.
5. YANG Zhi, ZHOU Xuan, TU Yangjun. The influence of packaging visual metaphor on brand perception[J]. Packaging Engineering,2019,40(02):55-59.DOI:10.19554/j.cnki.1001-3563.2019.02.009.
6. Zhao Zhiming. Image Construction of Visual Metaphors - An Interpretation of Mark Tansey's Works[J]. Writer,2012(10):239-240.
7. Chen Mengyao. Visual Metaphor Research and Design Practice in Poster Creativity [D]. Shanghai Normal University,2017.
8. Xinya Liu. Research on visual metaphor performance in graphic design [D]. Luxun Academy of Fine Arts,2022.DOI:10.27217/d.cnki.glxmc.2022.000020.
9. Guo Wei. Abstraction and similarity of image symbol reversal - an aesthetic analysis of visual metaphor generation means[J]. Chinese and Foreign Culture and Literature,2015(03):272-284.DOI:10.13760/b.cnki.csalt.2015.0090.
10. Zhou Yuho. Analysis of emotional metaphors in Munch's paintings[J]. China Packaging,2020,40(11):56-58.
11. Xiao Anbin. A comparative study of English-Chinese generic visual metaphors from the perspective of conceptual metaphors[J]. Journal of Taiyuan City Vocational and Technical College,2014(11):194-197.DOI:10.16227/j.cnki.tycs.2014.0086.
12. Liu T. Metaphor theory:transitive generation and visual rhetorical analysis[J]. Journal of Social Sciences of Hunan Normal University,2017,46(06):140-148.DOI:10.19503/j.cnki.1000-2529.2017.06.019.
13. Li Shuhui. Formal analysis of visual metaphors[J]. Beauty and Age (above),2022(07):10-12.DOI:10.16129/j.cnki.mysds.2022.07.043.
14. Yin Lijun. A study on the metaphors of TV health care advertisements [D]. Sichuan foreign language university,2017.
15. Huw G,S. O L. "Doors Started to Appear:" A Methodological Framework for Analyzing Visuo-Verbal Data Drawing on Roland Barthes's Classification of Text-Image Relations[J]. International Journal of Qualitative Methods,2022,21.
16. Purgar K. W.J.T. Mitchell's Image Theory[M].Taylor and Francis:2016-12-15.
17. Zhang Fan. Research on the Metaphorical Nature of Mark Tansy's Conceptual Painting [D]. Qufu Normal University,2019.

18. Xue Tingting, Mao Haoran. Twenty years of foreign visual rhetoric research: Focus and outlook[J]. Journal of Xi'an International Studies University, 2017, 25(03): 29-34. DOI: 10.16362/j.cnki.cn61-1457/h.2017.03.006.
19. Chen Ruijiao, Wan Yingyuan. Metaphors, metaphors, and contrasts: an analysis of visual rhetorical strategies in city image films[J]. Journal of Lanzhou College of Arts and Sciences (Social Edition), 2021, 37(04): 110-114. DOI: 10.13805/j.cnki.2095-7009.2021.04.018.
20. Zhang Di. Research on visual metaphor performance in graphic advertisement design [D]. North China University of Technology, 2021. DOI: 10.27108/d.cnki.ghelu.2021.000424.
21. Cao Shuo. Research on the influence of advertising visual metaphors on consumer cognitive behaviour [D]. Dalian University of Technology, 2019. DOI: 10.26991/d.cnki.gdllu.2019.004206.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

