

Visual Analysis of the Hot-Spots and Trends of Literary “Animal Image” Research in CNKI Based on Cite Space

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Abstract—The goal of cite space mapping analysis is to identify structures and then make comparison of the related mapping objects, such as probing knowledge structures, scientific change, research frontiers, invisible contact, and domain analysis, etc. In this study, Cite Space software was used to analyze the knowledge map of the published research articles containing “animal images” in China National Knowledge Infrastructure (CNKI) to provide a basis for relevant research work.

Index Terms—Animal image, cite space, change, trend, research frontiers

I. INTRODUCTION

The history of animal images or symbols from nature can be traced back to the Paleolithic age, when an animal was considered as a god, and was giving birth to the totem. The worship of animal symbols in nature is, to some extent, like a mirror, which can reflect the degree of human civilization at each historical stage.

One of the founders of myth criticism, Fraser, a master of cultural anthropology, believes that “image” reflects the human emotional needs through “ritual sense”. Besides, different ethnic cultures in legends demonstrate that human beings have some same needs in different regions and different periods.

In 1890, the anthropologist Frazer’s first edition of “Golden Branch: witchcraft and Religion” (“Golden Branch: Magic Religion”) was created. In his “golden branches”, he confirmed that in the spiritual development of mankind, the development of witchcraft preceded religion, and that all attributed their development to the next three stages. In the first stage: human beings have a wrong understanding of the causal relationship between the mysterious phenomena in nature and the religious rituals. He proclaimed that the mysterious phenomena were archetypes which had profound meanings especially the natural images closely connected to the development of humans. It’s a vast and mysterious field for researchers to probe and do more research.

Psychoanalyst Jung believes that “image” is the typical mode of repeated prototype which was inherited by ancestors from generation to generation, and he also believes the collective unconsciousness was not directly perceived in the long-term human psychological accumulation, but was initially presented as” original image “manifested as mythological images in ancient times, and then transformed into artistic images through art in different times [1]. People

studied the animal images appearing in the ancient culture, and found that the ancient images had a strong naturalistic color. The symbolic images of China and the West are not only the pulse of naturalism, but also reflect the journey of the development of social civilization.

In contemporary world, some scholars both in China and abroad have been probing the animal image in literary works and we could figure out more clearly on the “animal image” theme related hot-spots and research focus changes and the trend from the analysis of the animal images by cite space analysis in the latest decade.

II. RESEARCH METHOD

Bibliometric takes the literature system and its characteristics as the research object of mathematical and statistical metrological research methods to explore some structural characteristics and laws of science and technology [2].

Cite Space tries to analyze the visual co-citation network of the target materials and aims to show the development and evolution of scientific frontiers in the field of knowledge [3].

After we got 539 articles related to the theme of animal image from CNKI from 2012 to 2022, we did screening and refinement of the collected data through CNKI during the latest decade, and then deleted some irrelevant articles in scientific or technological field. Because partially ambiguous terms, screening and refinement need to be done to present a more reasonable research profile of this field in a relatively precise way [4]. We then got 363 articles on image and eventually got 144 literary articles on animal image as the core research bibliography, and then we dig out the core concepts reflecting the research focus, the changes of scientific research hot spots relating to the animal image study especially in literary field, and the research frontiers and trends of the theme related research domain.

The articles relating to animal image through Cite Space studies were exported in Ref works format and saved under the name “download_XXX”. Data format conversion using Cite Space built-in Data import / Export to form an available literature format [5]. The Cite Space parameter was set, and the time span is nearly a decade from 2012 to 2022. The node types are the keywords of publication quantity, the relationship of the authors and institutions, the key words of research hot spots. And then we set the parameter as the default setting, for the visual analysis and knowledge map relating to do further study of the interactions of key words and the changes of research theme and then probe the reason for the changes.

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III. RESULTS AND DISCUSSION

A. Timeline View

After screening and searching, 144 literature articles were obtained. During the ten years' period, as can be seen from Fig. 1, the "animal image" research continues to show a wavy development trend. In particular, the annual number of documents increased significantly in 2019 and research one summit. Till the research deadline in August 2022, it reached a low point but there were still five months and there probably would be more. All in all, it can be inferred that the total number of documents may go up and go down in the following years and continue to develop in waves, and the wavy development trend would be the main trend of the research article production.

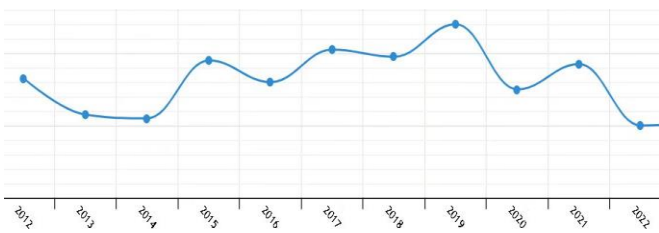


Fig. 1. Timeline view from 2012–2022.

B. Author Collaborative Cooperation and Production

When setting node type as author, the number of nodes is 351, the number of lines is 323, and the density is 0.0053. As showed above in Table I that in the academic cooperation map based on the theme, Lifu Jiang, Xinlai Jin, Jiaji Chen, Hongfang Wang, Huijuan Liang are the top five authors with high article productions and the other authors, such as Li Wang, only have two or less than two articles on animal image study. It is known that the cooperation and exchange between institutions is conducive to resource integration and achievement output [6]. But the result turns out that all of authors are from different research institutions and have no any cooperation programs. Furthermore, each author has a relatively low production in the production output on animal image study in the period of 2012 to 2022. The number of articles of the authors with the same theme is generally low, three articles at the most, and some have only one article relating to the theme of animal image. Therefore, as there is little cooperation among the authors or research institutions, it also means that there is almost no joint research result relating to the same theme of animal image research.

TABLE I: AUTHOR COLLABORATIVE COOPERATION AND PRODUCTION

author	production	institution
Lifu Jiang	4	Nanjing University of Aeronautics and Astronautics
Xinlai Jin	4	Nantong University
Jiaji Chen	3	Jiang Nan University
Hongfang Wang	3	Southwest University
Huijuan Liang	3	Hubei University
Li Wang	2	Dalian University

All in all, it can be seen from Table I that the cooperative relationship between scholars with the largest numbers is not

close enough, and there are many single conducted phenomena; the number of scholars' productions on the theme of animal image is relatively small. Therefore, we can make a conclusion that there is still large cooperation space and team cooperation potential in this research field relating to the research theme of animal image. The small-scope cooperation network formed by the separate research institutions with separate nodes will strengthen scientific research exchanges and get more benefits from cooperation.

C. Research Hot Spots and Frontiers

And during the third stage, we did study of hot spots and frontiers on animal image by Cite Space v.6.1.R3, and first we set the parameter as in Fig. 2, the detailed parameter data as as follows.

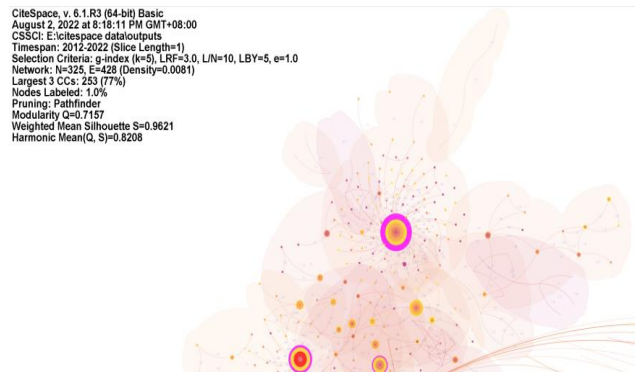


Fig. 2. Keyword co-occurrence map.

Time span: 2012–2022 (Slice Length=1), Selection Criteria: g-index (k=25), LRF=3.0, L/N=10, LBY=5, e=1.0, Network: N=325, E=428 (Density=0.0081), the largest CC:247(76%), Nodes Labeled: 1.0%, Pruning: Pathfinder Modularity Q=0.7157, Weighted Mean Silhouette S=0.9673, Harmonic Mean(Q,S)=0.8227 and gain the keyword co-occurrence map as Fig. 2. The node type is the keyword "animal image" and it obtains the most popular research issues. On the basis of the keyword co-occurrence map, the number of mining points is 325, the number of connections is 428, and the density is 0.0081. These key words sharing the "LLR log-likelihood ratio algorithm" fall into 10 main clusters as in the following Table II.

TABLE II: TOP TEN KEY WORD CLUSTERS

No.1 image	No.6 vocabulary
No.2 animals	No.7 poetry of Kingdom Chu
No.3 the metaphor	No.8 symbol and icon
No.4 Poetry	No.9 animal type research
No.5 animal narration	No.10 dual perspective

Among the top ten key words clusters, each cluster is composed of multiple closely related words, and the smaller the cluster number, the more keywords contained in the cluster. As showed in Table III below, the most popular word clusters are relating to cultures and closely related to each other to some extent.

TABLE III: CLOSELY RELATED WORD CLUSTERS

Archetype	Symbol	Animal words
Geographic	Totem	Folk
Imagery		Custom

Furthermore, by cite space study, with the help of “Cluster Explorer”, we found more keywords, and they could be classified into different classes as in Table IV below. The word cluster relating to animal images in the literary articles in CNKI is blooming with varied focuses.

Among the key words in Table IV, so many key words are hot issues in the field of literature with high attention and in-depth research. The research scope and field is enlarged and extended to a wide range of research issues. The key words cluster analysis by cite space helps us to know more about the connections of the key words and the changes and trend of research domain.

TABLE IV: CLASSIFICATION OF WORDS CLUSTERS

Rhetoric	Yan Mo	Anti-colonial
Voice	Hong Xiao	Psychology
Dialogue	Qu Yuan	Ecology
Narrative	Sonnet	Cartoon
Geography	Female view	Connotation
Anti-moral	Margin	Margin

D. Time Sequence of Key Words

Based on the analysis of keyword co-occurrence as in Fig. 3 above, the keyword time sequence map is generated and become more enriched according to different time fragments, different branches and in different research periods.

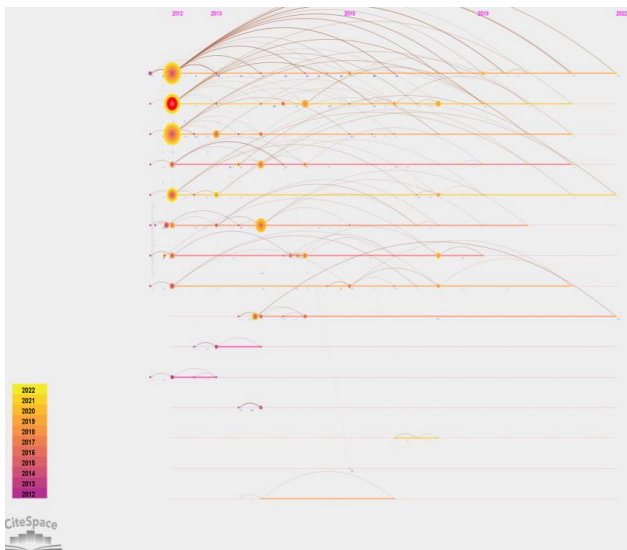


Fig. 3. Time sequence of key words.

From 2012 to 2013, the main focus was on the archetype study separately especially in ancient literature both in China and abroad, keywords are listed as follows, image schema, metaphor, Geographical imagery, totem, Qu Yuan, the Book of Songs, Sonnet, etc.

From 2014–2015, the key words changed to evaluation, theme, comparison and narrative. It shows that the theme of study on animal image was gradually changing and began to have connections with other fields, not been restricted to the field of archetype criticism or ancient literature.

From 2016–2019, lots of research articles appeared together with flourished key words like: Anti-colonialism, feminine, Poetry of Tang Dynasty, psychological system, functionalism, etc. Researchers had opened up to absorb new concepts and new ideas into the research of animal image.

From 2020–2022, more modernized words flooded into

the related field of animal image study, such as animal image study in realistic works, modern films, cartoons and more foreign writers and their works were also becoming hot spots.

As more and more closely related words appeared and the research intensity has been strengthened, and the development direction has begun to develop in depth, involving Chinese and foreign literary works, different genres of literary works and literature from ancient times till contemporary days [7]. The research vitality continues to be maintained, and the research intensity is gradually enhanced. It is expected to carry out high-quality multi-center cooperation on the research focus of animal image, and the research articles relating to ancient and modern literary works, both at home and abroad, should continue to be probed more deeply, so as to inject more vitality into the development of research domain of animal image.

E. The Reasons for the Shift and Trend

1) Globalization

As the development of globalization and internationalization, “Culture”, “history”, “context” and “media”, “class” and “race”, “self-recognition” and “moral power”, “bilingualism”, “multi-culture”, ecological study of literature, etc. in different research fields have been mixed into the new world, new culture and new paradigm of research, and thus made a blooming trend of cultural globalization.

Due to the development of globalization, the network as a new communication medium, make more research materials available online. For instance, people can get more literature works from the Internet in the home country and abroad, know more about different literary critical insights, so different schools of thoughts bloomed and lots of open and free resources for people come nearer to literature as well.

There is obvious difference in the research materials due to the influence of regional and geographical cultural differences. For example, there are research articles relating to animal images in China, Japan and America and England, etc. But the focus of research in Chinese animal images are largely related to original mysterious animal images like dragons, cows, horses, etc [8]. The focus of research in Japanese animal images are strongly connected to fish or other animals in the sea, while the animal images being studied in American and British works are always associated with sheep, snake, etc. Because China has been an agriculture-based country since ancient times, and farmers have been worked in the farmland for generations. Therefore, people have profound feelings and adoration for cattle. As an island country, Japan is surrounded by sea, dotted with natural fishing grounds. Special geographical location has created Japan’s developed fishery. The Japanese language is especially rich in fish-related common sayings. Different kinds of animals in a certain place can constitute the sayings and vivid images with profound symbolic meanings [9]. The symbol of fish appeared frequently in Japanese literary works while sheep sacrifices in European and American works.

The research focus has shifted from ancient Chinese literary works to modern and contemporary literary works. As for the changes in the animal image related research genre, it also has transferred from the frequently mentioned Chinese poems and novels to varied genres like TV program shows,

films, documentaries, etc. Furthermore, the animal image related research focus has also spread from Chinese literature and writers to both domestic and foreign literary fields. For instance, Japanese literature and European and American literary works are also mentioned in the research articles during the time span from 2012 to 2022.

To some extent, the comparative research is flushing as the globalization has rapidly developed and impacted us in recent years.

Therefore, the open research environment which makes the animal related research more and more subject and domain associated, also contributes to the radiated spreading of research domain and the flourished development related to animal images [10]. In addition, the surprisingly huge research data which were accessible online, as well as the free sharing of research methods like cite space, make the research of animal image no longer be confined to just one category of the research field such as the archetype criticism popular in the last century. Thanks to globalization, the research focus of animal image associated with varied global hot issues was endowed with brand-new and endless research vitality.

2) Marginal voices and minority discourse

Feminism advocates breaking up the male discourse power and viewing the world from a female perspective. Since the Renaissance, with the emergence of the western enlightenment thought, the modern concepts of freedom, equality and fraternity have had an influential effect on the society. The feminist movement in the 19th century was mainly the bourgeois women demanding the specific equal rights to participate in politics, employment and education from the male rulers of their own class. It was only gender equality in the superficial sense, but in fact it did not touch the patriarchal culture itself. Female's feelings and rebellion and female writers' works could not be widely accepted by the society, and women's voice has not formed a climate. During contemporary times, men's dominance in literature has been touched and shaken, women writers strove to use symbolic images in literary works including animal images to depict their delicate and fragile feelings and so there were more and more animal images with symbolic meanings existed in their works.

Some of the research paper related to the novels of woman realistic write Hong Xiao who was popular in China of 2030s, are mainly depicting the animal images in one of her well-known novel "the battlefield of life and death" where women's fates were as miserable as domestic animals or the farm livestock of cattle, pigs and horses which were trained and tamed animals without liveliness or the wildness of nature. Before the founding of PRC, in the old times, some women had no voices in marriage or in working places, because at that time women were like a birth machine and their own mission was to breed children and reproduce the younger generations. They had less chances to work and earn money, so they had no financial freedom, as it's known that the economic base determines the thoughts and mindsets, that's why they had no personal identities and no voices in society. So many women writers took aids of animal images to reveal women's real life and inner feelings after the

founding of PRC, women have gained more freedom and voices in life, and they dare to speak for themselves.

As different discourses mixed together and developed rapidly in modern times, the once overlooked voices appeared and gained attention [11]. So in literary field, the research domain of animal image is extended and expanded as the world develops and communication strengthens.

IV. CONCLUSION

All in all, the analysis of animal image based on cite space, especially the key words analysis, help to strengthen the research intensity and make the development direction clearer. through the research, it is undoubtedly clear that the research hot spots on animal image continue to be maintained, but the research intensity is gradually enhanced as the development of globalization and blooming of multiple voices. It is expected to carry out more high-quality multi-center cooperation on the topic of animal image, and the research articles linking ancient and modern times at home and abroad should continue to be explored and penetrated, so as to expand the research depth of animal image. It also provides people with new insights and new lights on the analysis of other related research fields.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

- [1] V. V. Rebrick, *Ancient History of the World*. Shanghai: Century Publishing Group, Shanghai People's Publishing House, 2005, pp. 235–236.
- [2] C. Chen, "Cite space II: Detecting and visualizing emerging trends and transient patterns in scientific literature," *Journal of the American Society for Information Science and Technology*, p. 359, 2006.
- [3] C. Chen, "Science mapping: A systematic review of the literature," *Journal of Data and Information Science*, pp. 4–5, 2017.
- [4] Y. Chen, "Cite space methodological function of the knowledge graph," *Scientific Research*, pp. 242–243, 2015.
- [5] C. Chen, "Predictive effects of structural variation on citation counts," *Journal of the American Society for Information Science and Technology*, pp. 431–432, 2012.
- [6] H. D. White, "Visualizing a discipline: An author co-citation analysis of information science," *Journal of the American Society for Information Science*, vol. 49, no. 4, pp. 327–356, 2016.
- [7] Y. Li, "The trend of revaluing modern and the re-understanding of Chinese modern literary tradition," *Literary Review*, p. 127, 2002.
- [8] J. Chen, "The historical inheritance and type of Chinese literary animal narrative," *Journal of Xiamen University*, vol. 5, pp. 55–67, 2015.
- [9] S. Xie, "A comparative study of Tang Xianzu and Shakespeare's plays —Take the Peony Pavilion and a Midsummer Night's Dream as an example," *Journal of Fuyang Normal University*, vol. 1, pp. 31–38, 2022.
- [10] P. Wang, "Visual map analysis of ecological literature research at home and abroad," *Foreign Literature*, vol. 34, no. 4, pp. 16–22, 2018.
- [11] W. Cary, *Animal Rites: American Culture, the Discourse of Species, and Post humanist Theory*, Chicago: University of Chicago Press, 2019, pp. 235–236.

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