
| RESEARCH ARTICLE

A Comparative Study of *Silent Spring* and *A Sand County Almanac* under Ecocriticism Theory

Chuyi Zhang

College of Foreign Studies, Jinan University, Guangzhou, China

Corresponding Author: Chuyi Zhang, E-mail: 867931934@qq.com

| ABSTRACT

Silent Spring is important in the field of natural literature. However, studies on it are only few, and most of them are based on traditional literary study methods. Corpus stylistics emerged in the 1980s, providing a new paradigm for literary research which transcends traditional literary research methods in many aspects. Based on ecocriticism, this study conducts a comparative study on the themes, language features and narrative perspectives of *Silent Spring* and *A Sand County Almanac* by using corpus tools. The results show that, as for the themes, *Silent Spring* pays attention to the intervention of human activities on nature, while *A Sand County Almanac* focuses on the charm of nature itself. In terms of language features, *Silent Spring* is more objective and convincing, while the language of *A Sand County Almanac* is more vivid. As for the narrative perspective, *Silent Spring* often uses an objective third-person perspective, while *A Sand County Almanac* uses a subjective first-person perspective. Although *Silent Spring* and *A Sand County Almanac* are different in themes, language features and narrative perspective, they both reveal a love for nature and strong awareness of environmental protection.

| KEYWORDS

Silent Spring, *A Sand County Almanac*, Ecocriticism, Corpus

| ARTICLE INFORMATION

ACCEPTED: 22 April 2023

PUBLISHED: 28 April 2023

DOI: 10.32996/ijllt.2023.6.4.20

1. Introduction

Silent Spring, published in the 1960s, is a popular science work written by Rachel Carson. It marked the beginning of ecological writing in America. It is one of the most representative works of ecological literature. This work, because of its in-depth description and discussion of the influence of human activities on nature, caused a great sensation in society at that time. Besides, it caused people to think about how their activities harmed nature for the first time. For a very long period of time, people had neglected nature for the rapid development of industry and society. However, as the consequences of ignoring nature began to show, people gradually realized the importance of protecting the environment. For example, many countries put forward the policy to put development and protecting nature in the same position, or even put protecting nature in the first place. Obviously, ecological literature is in concordance with their needs. Therefore, studying ecological literature is critical in nowadays society. Nevertheless, although *Silent Spring* is a representative work of ecological literature, there have been only a few studies on it, and the methods used in most of the research were traditional literary analysis methods that are criticized as subjective.

With the rapid development of computer science and technology, corpus-based study has become a new means of studying literature. Since the 1980s, researchers began to study literature work by using corpus tools (Hu & Yang, 2019), which marked the appearance of corpus stylistics. However, till now, corpus stylistics is still in its infancy, especially in China. Relatively speaking, research results abroad are richer than in China (Mao, 2021; Zhuge & Wu, 2022). In China, the studies based on corpus stylistics are only a few.

Literary study based on corpus stylistics can be divided into four aspects, i.e. the corpus-based study of literary works, the corpus-based study of authors, the corpus-based study of literary theories and corpus-based study of literary history (Hu & Yang, 2019). A corpus-based analysis of literary works provides a new paradigm for literary studies, which can not only provide objective linguistic evidence for previous studies but also dig out meanings that have not been discovered by previous researchers.

Therefore, this paper aims to compare *Silent Spring* and *A Sand County Almanac* by corpus tools based on ecocriticism theory.

2. Literature Review

2.1 Ecocriticism

Ecocriticism is generally believed to be born in the 1970s (Zhang, 2022). In 1978, William Rutterk published an article entitled *Literature and Ecology: An Experiment of Ecological Criticism* in the ninth issue of *Iowa Review*, in which the concept "ecocriticism" first been put forward. The feature of ecocriticism is that it connects literature and ecology. It was not until the 1990s that ecocriticism theory officially became a theory used in literary studies.

The birth of ecocriticism has the inevitability as a result of the development of human society to a certain extent. In ancient times, human beings had very little power, so they did not have the ability to change nature. However, they deeply relied on nature and were strongly affected by nature. Therefore, they were respectful of nature at that time. Until modern times, after the Second Industrial Revolution, the industry and technology human beings created enabled them to change nature. Since then, human society has entered a new period—to develop industry wantonly.

However, around the middle of the twentieth century, with the pollution caused by the Industrial Revolution began to show and the emergence of natural disasters, people began to realize the damage to nature by human beings and the harm thus caused to human beings themselves. Human beings started to think about the relationship between them and nature. At the same time, literary researchers began to study literary works from a new perspective named De-anthropocentrism. From this perspective, many ecological critics consider *Silent Spring* as the beginning of American ecological writing. Besides, this work has also become the catalyst for the modern Western environmental protection movement.

Ecocriticism theory has been popular among scholars since its birth, but scholars have not reached a consensus on its definition. Zhang (2022) thinks that the broad sense of ecocriticism refers to the relationship between human beings and nature, while the narrow sense of ecocriticism appears as an academic concept, which is a research theory, a perspective and a methodology. In the second half of the 20th century, ecocriticism experienced three waves from its rise to maturity. The ecological critics in the first wave equated the environment with nature and often tended to over-romanticize nature, such as Thoreau, Wordsworth, Emerson and other writers who loved praising nature. However, the ecological critics in the second wave used more diversified criticism methods. The environment they thought was no longer the natural environment only but also the "environmental attribute" of the text, that is, the social background and humanistic background of the text. At present, ecocriticism is in its third wave, named Anthropocene Wave, that is, which focuses on the transformation and influence of human activities on nature.

Ecological literature is a kind of literature that embodies the central idea of ecocriticism theory, including literary works that reveal ecological consciousness in every form (Li, 2022). The essence of ecocriticism theory is to explore the relationship between man and nature, which opposes the traditional value of anthropocentrism and pays attention to the common crisis and survival dilemma of human beings (Ren, 2022; Wang, 2022). For a long time, human beings have adhered to the idea that "man will conquer nature" and believed that human beings have the ability to transform nature. However, when human beings over-transform nature, the results turn out to be bad. Overemphasizing the position of human beings makes humans belittle the power of nature, which results in the conflict between human beings and nature. In fact, man is a product of nature, and it is also a part of nature. Man becoming more powerful does not mean they can conquer nature. Ecocriticism, opposing the view of anthropocentrism, emphasizes the power and status of nature. It believes that human beings are only a drop in the ocean of nature and need to have awe of nature (Ren, 2022). From the perspective of desire theory, the conflict between human beings and nature results from the conflict between human beings and their own desire (Tian & Sun, 2022).

2.2 Previous Studies Based on Ecocriticism

There is much research based on ecocriticism theory, including the study of literary works, translation and film and television works. Though, studies on the field of literary works still account for the most. Tang and Wei (2019) analyzed the triple space in the novel *The Year of the Flood* by Margaret Atwood. In this study, the ecological perspective refers to the social environment perspective rather than the natural environment perspective. The author thought that only by constructing a place that makes people feel attached, preaches local justice and is pluralistic and open can people really care for their local homes. Li (2022) studied a Japanese novel named *The Emissary* from the perspective of ecological theory and found that in this book, the human body and environment are not two separate elements but an interactive whole. Wang's (2022) study, which was based on the Marxist's ecological view,

studied the ecological elements in Chinese scientific novels. He believes that everyone is responsible for the ecological crisis, and the globalization of capitalism results in environmental and social crises. Moreover, Ren (2022) discussed the relationship between human beings and nature in the Japanese novel *Through the Arc of the Rain Forest* based on ecocriticism and found that non-human matters also had the narrative ability and implementation abilities.

Except for applying in literary works, ecocriticism has also been used in other fields. For example, Zhao and Geng (2021) studied the ecological thinking and strategies of the Chinese-English translation of Wang Honggong's poetry. They found that Wang gave up the subjectivity of human beings while emphasising the agent power of things in translation. Jia (2019) chose movies about ethnic minorities as research subjects and studied their natural writing, intersubjectivity and home consciousness. Besides, Zhang (2019) and Liu (2019) analyzed the movie *Annihilation* and *A Dog's Purpose*, respectively.

To summarize, it can be seen that ecocriticism theory is rich in connotation and wide in applicability, which is suitable for the analysis of different kinds of works.

3. Methodology

3.2 Research Objects

In this study, Rachel Carson's *Silent Spring* and Aldo Leopold's *A Sand County Almanac* are selected as the research objects. In the following paragraphs, these two works will be briefly introduced.

Silent Spring, published in 1962, is a popular science book by American writer Rachel Carson. Rachel Carson was born in 1907 and died in 1964. She showed a strong interest in nature when she was young and became a biologist in her later study career. Her book *Silent Spring* has become an important tool to change the views and practices of environmental protection in the United States and even the world. *Silent Spring* was first serialized in the *New Yorker* in 1962. It aroused the public's attention once it came out and once became the top seller at that time. The book illustrates the toxicity of chemicals to nature and calls for more restraint in the use of chemicals.

A Sand County Almanac is a collection of natural essays and philosophical essays written by American writer Aldo Leopold. It was first published in 1949. The book records Aldo Leopold's experience of ecological restoration on a farm in Wisconsin, USA. In the order of four seasons passing, the language of the books is lyrical, vivid and infectious. It also records the author's thoughts during his life working and traveling in various States of the United States. *A Sand County Almanac* is considered as "the Bible of ecological thought". Together with *Walden Lake* and *Silent Spring*, it is called one of the "Trilogy of Natural Literature".

Silent Spring and *A Sand County Almanac*, both as natural literature, can be better understood from the perspective of ecocriticism. Therefore, this study aims at comparing the themes, language features and narrative perspectives of these two works based on ecocriticism.

3.2 Research Instrument

Sketch Engine was selected to analyze the two works in this study. Sketch Engine is a web-based corpus tool which belongs to the third-generation corpus tool. It is mainly used for text analysis and text mining. It contains more than 600 corpus, covering more than 90 languages, and has many powerful functions. Sketch Engine not only has the basic functions of corpus tools such as keyword retrieval, vocabulary generation and concordance retrieval but also has some new features, such as bilingual parallel concordance, bilingual terms, synonym retrieval, word sketch, colligation and visual chart generation.

3.3 Research Method

Comparing themes: In order to compare the themes of the two works, keywords were extracted and analyzed in Sketch Engine. As the BNC corpus is a common British corpus, this study selects the BNC corpus as the reference corpus. After importing the two clean works into Sketch Engine, the top 15 keywords of the two works were extracted and categorized according to part of speech. Words of a different part of speech were placed in a different group. The second step is to see the word sketch of each keyword, i.e. the collocation of each keyword, and observe what the commonly used modifiers around the word are, whether they show negative or positive meanings. The third step is to use the concordance function to confirm the particular occurrence of keywords in the text. The fourth step is to see the relationship between keywords by using the visualization function of synonym retrieval. From nouns, we can know what the text is talking about, so noun keywords were first analyzed. After searching the noun keywords, the same research steps are carried out on the verb vocabulary.

Comparing language features: In Sketch Engine, after the text is imported, the system will automatically generate a basic information report, in which basic information such as language category, type number, token number and sentence number of the text can be seen, by which the type/token ratio of the text can be calculated. The type/token ratio is an index of lexical

complexity. Therefore, the type/token ratio is helpful in evaluating the language feature of the two works. Then, through artificial discrimination of keywords, we can observe whether there are special text features. If there is, we can affirm by concordance.

Comparing narrative perspective: In this step, I used the wordlist function of Sketch Engine. After extracting the pronoun wordlist, the narrative perspective can be compared.

4. Results

4.1 Themes

The noun keywords of *Silent Spring* can be categorized into four types, which are "Chemical substances", "natural elements", "human diseases", and proper nouns of names of people and places. The following table is the categorization of the noun keywords of *Silent Spring*:

Table 1 Categorization of noun keywords of *Silent Spring*

Category	Words
Chemical substances	ddt, insecticide, heptachlor, dieldrin, chlordane, parathion, aldrin, arsenic, lindane, herbicide, hexachloride, DDD, marathion, endrin
Natural elements	Elm, budworm, insect, borer, beetle
Human diseases	Leukemia, carcinogen, tumor, screw-worm
Proper nouns	Miramichhi, Alabama, Klamath, Hueper

The noun keywords of *A Sand County Almanac* can be categorized into five types, which are "time", "plants", "animals", "proper noun of places", and "natural elements". The following table is the categorization of the noun keywords of *A Sand County Almanac*.

Table 2 Categorization of noun keywords of *A Sand County Almanac*

Types	Words
Time	year, day, time, almanac
Plants	Tamarack, silphiu, Jackpine, mesquite, pine, cottonwood, alder
Animals	Chickadee, grouse, grizzly, woodcock, grebe, quail, chihuahua, muskrat, plover
Proper noun of places	Wisconsin, Sonora, prairie, woodlot, wilderness, rimrock, sandbar
Other natural elements	sand, soil, wood, river, mountain, water, marsh, winter, spring, sun, wind, fire, sky, wildlife

Comparing the categories of the two works, I found that the keyword types of *Silent Spring* show bigger differences. There is a causal relationship among the types "chemical substances", "natural elements", and "human diseases". As for "chemical substances", it is artificial products that are developed by human beings to protect crops from the interference of pests or weeds. It can be understood as human intervention means. However, both pests and weeds are part of nature, and they don't matter whether they are good or bad. It is precisely because human beings have the demand for crop growth that "pests" and "weeds" are artificially classified as pests and weeds. The second types are "natural elements", including some insects, which are part of nature. The third category is some "human diseases". Looking at these three keyword categories, we can infer that disease is a consequence, which is the consequence after human beings use chemical substances to intervene in nature.

In *A Sand County Almanac*, the types of keywords are relatively consistent, most of which are natural elements, including plants, animals and other natural elements. It shows that the author devotes himself to the description of various elements of nature and prefers to simply appreciate the beauty of nature. In addition, there are keywords about "time" that show obvious characteristics, which echo the title of this book. Almanac means that the author is writing in time order, so there will be many words about the passage of time.

Although ecological consciousness is shown in both works, the focus and manifestation techniques are totally different in the two works. According to the three waves of ecocriticism, *A Sand County Almanac* (1949) was written in the period of the first wave; thus, it is full of romantic color and praise for nature. However, *Silent Spring* (1962) was written in the period of the second wave. Except for focusing on the natural environment, it placed great importance on integrating the social environment into the natural

environment. For example, it focused on the interference and damage of human activities on nature and the common dilemma and environmental crisis faced by all human beings, which is the reason why many researchers considered *Silent Spring* as the beginning of American ecological writing.

When comparing the verb keywords of the two works, results showed that the negative verb "kill" appeared many times in *Silent Spring*. Therefore, the word sketch function was used in this word. It was shown that the object of the word "kill" was mainly related to plant and animal words such as "fish", "insect", "cell", "bird", "plant", and "wildflower". Besides, the subject of "kill" are mostly words related to chemical substances and insecticide such as "ddt", "endrin" and "dioldren". It can be inferred that when the action of killing happened, the victims were generally animals and plants, while the killers were human-made chemical substances. In other words, the killers are human beings. Therefore, human activities have done great harm to nature.

According to the analysis of the keywords of the two works, it is found that their themes are different. In *Silent Spring*, the author focused on both man and nature and emphasized the harm human activities do to nature. While in *A Sand County Almanac*, the author concentrated on the beauty of nature and devoted to describing natural elements. In other words, the emphasis of the former is both man and nature, while the latter is only nature.

4.2 Language Features

The type/token ratio is an index to evaluate the lexical complexity of a text. The higher the ratio is, the lower the lexical complexity is.

Through the basic information report, we can calculate the type/token ratio of the two works. Results show that the type/token ratio of *Silent Spring* is 8%, while the ratio of *A Sand County Almanac* is 13%, which is 5% higher than the former one. It means that *Silent Spring* has a higher lexical complexity than *A Sand County Almanac*. In other words, reading *A Sand County Almanac* may be simpler. As for the text genre, *Silent Spring* is a popular science book which contains many proper nouns of chemical substances, while *A Sand County Almanac* is a prose book which contains nouns of animals and plants. Relatively speaking, the words of *A Sand County Almanac* are much closer to life. Therefore, it is reasonable that the type/token ratio of *A Sand County Almanac* is higher.

The second characteristic is the number used in *Silent Spring*. There are about 800 concordances, including the number in it, which means that the author used a lot of statistics to confirm her viewpoints. This is very important for popular science writing. Evidence based on data makes the language more convincing, which is one of the reasons why the text caused a great sensation.

The third characteristic is the use of color words in *A Sand County Almanac*. When extracting the wordlists of different parts of speech, it is found that the frequency of color words is high, among which the frequency of color words such as white, red and green reaches 100 times. The wide use of color words can describe nature vividly and also make the words of *A Sand County Almanac* more vital. When analyzing the concordances of color words, it is found that most of the objects modified by color words are natural elements such as animals and plants. Highlighting the beauty and vitality of nature can stimulate readers' interest and love for nature.

To summarize, the language of *Silent Spring* is more scientific, while the language of *A Sand County Almanac* is more literary.

4.3 Narrative Perspective

Both texts are natural literature, but they are different in themes and language features. After extracting the pronoun wordlist, it is found that the narrative perspective also shows a difference. The following table represents the frequency of pronouns of *Silent Spring* and *A Sand County Almanac*:

Table 3 Frequency of pronouns in *Silent Spring*

Pronoun	Frequency
it	616
their	330
they	311
its	271
we	256
our	160
them	158
his	131

he	101
us	50

Table 4 Frequency of pronouns in *A Sand County Almanac*

Pronoun	Frequency
it	561
I	421
his	354
he	298
we	283
their	210
they	206
its	205
my	193
our	128

In both texts, the most frequent pronoun is “it”. That’s because “it” often appears at the beginning of a sentence as a formal subject. After excluding “it”, the third person plural pronoun “they” and “their” appear most frequently in *Silent Spring*, while the first person singular pronoun “I” appears most frequently in *A Sand County Almanac*. In *Silent Spring*, the author looked at nature from the perspective of the third person, that is, from the perspective of an outsider. From this perspective, the author described the influence of man on nature in a rational way, which shows great objectivity. However, in *A Sand County Almanac*, the author preferred to use “I”, which means that the author described nature from the perspective of a participant and expressed her own thoughts and feelings on nature. Under the angle of ecocriticism, man, as a part of nature, is equal to nature, so they should respect and love nature. In *Silent Spring*, the author reflected on the harm of human beings to nature with an objective and rational attitude, while in *A Sand County Almanac*, the author expressed his love for nature with a subjective attitude from the perspective of a participant. No matter in what way, we can see the two authors’ respect and love for nature. Therefore, although the two works are different in their narrative perspectives, their essence and purpose are the same.

5. Conclusion

Although *Silent Spring* and *A Sand County Almanac* are both natural literature, there are differences in themes, language features and narrative perspective. *Silent Spring* pays attention to the damage to nature caused by human use of pesticides and the consequences of damaging nature to human beings, aiming at calling on everyone to stop using pesticides, while *A Sand County Almanac* focuses on praising the animals, plants, mountains and rivers in nature, which is full of romantic color. In terms of language features, the language of *Silent Spring* is more objective because the author is good at using data to prove her own views. Therefore, the viewpoints of *Silent Spring* are convincing. However, the language of *A Sand County Almanac* is more vital because the author uses color words to describe nature, which arouses readers’ imagination of nature. As for the narrative perspective, *Silent Spring* mainly uses the third person plural pronoun to describe the human intervention in nature from an objective third person perspective, while *A Sand County Almanac* mainly uses the first person singular pronoun to express her own love for nature. Although there are differences in the above three aspects between the two literary works, the natural consciousness revealed in them conforms to the thought of ecocriticism theory.

However, because of the time limitation, the analysis of the results was made by only one person, which may be subjective. Future studies can include 2-3 researchers to make the analysis of the research results, which can improve the reliability of the analysis. Besides, the wordlist of Sketch Engine can only display the most frequent 100 words, but the frequency cannot tell everything. Words in a low frequency may also show some important features. Therefore, future studies can combine other corpus tools to analyze the words at a low frequency. Moreover, future studies can also include *Walden Lake* in the comparison to get a more comprehensive understanding of ecological literature.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Publisher’s Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

References

- [1] Hu, K. B., & Yang, F. (2019). Corpus-based studies of literature: Connotation and Significance. *Journal of Zhejiang University (Humanities and Social Sciences)*, 49(05), 143-156.
- [2] Jia, X. N. (2019). Nature writing, intersubjectivity and homeland consciousness on minority films from the horizon of ecocriticism. *Contemporary Cinema*, 2019(11), 125-129.
- [3] Li, Y. N. (2022). Body consciousness and environmental narration: Reading *The Emissary* from the perspective of ecological criticism. *Journal of South China Normal University (Social Science Edition)*, 2022(03), 184-208.
- [4] Liu, X. R. (2019). An ecocritical interpretation of *A Dog's Way Home*. *Movie Literature*, 2019(15), 126-128.
- [5] Mao, W. W. (2021). Corpus stylistics in Japan: Progress, problems and prospect. *Journal of Foreign Languages*, 44(03), 82-90.
- [6] Ren, H. (2022). The sense of life community in *Through the Arc of the Rainforest* from the perspective of material ecocriticism. *Journal of Xi'an International Studies University*, 30(02), 74-77.
- [7] Tang, J. N., & Wei, J. X. (2019). An ecocritical analysis of the three spaces in *The Year of the Flood*. *Journal of PLA University of Foreign Languages*, 42(4), 60-84.
- [8] Tian, H. Y., & Sun, H. X. (2022). The study of eco-criticism from the perspective of "Desire theory": Research status, core issues and ways relief. *Theory Monthly*, 2022(03), 153-160.
- [9] Wang, B. (2022). Ecocriticism in contemporary Chinese science fiction. *Comparative Literature in China*, 2022(03), 2-14.
- [10] Zhang, C. (2019). *Annihilation* from the Perspective of Ecocriticism. *Movie Literature*, 2019(18), 129-132.
- [11] Zhang, Z. (2022). The third wave of ecocriticism: Discourses of the Anthropocene and its limits. *Social Sciences in Chinese Universities*, 2022(03), 147-160.
- [12] Zhao, M. O., & Geng, J. Y. (2021). An ecocritical study of Kenneth Rexroth's translation of classical Chinese poetry. *Chinese Culture Research*, 2021(02), 133-143.
- [13] Zhuge, X. C., & Wu, S. X. (2022). Corpus-based literary stylistics studies abroad: overview and prospect. *Foreign Language Research*, 2022(04), 11-18.