Axiological Analysis of the Evolution of Cultural Vocabulary in Academic Discourse

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Abstract: From the perspective of multimodal corpus, this study deeply analyzes the characteristics of the use of Chinese vocabulary and the law of pragmatic evolution in academic language writing scenes. The case analysis method is used to select academic texts and reports in the fields of science and technology, humanities and social sciences, medicine and other disciplines as the real corpus, and the comparative research method is used to compare the use of cultural vocabulary in different periods and disciplines. In the exploration of cultural vocabulary and multimodal collaborative application mode, three modes of complementarity, reinforcement and expansion were found. In the complementary mode, cultural vocabulary makes up for the shortcomings of other modalities in conveying abstract cultural connotations. The reinforcement mode is manifested as a multimodal enhancement of the ideographic effect of cultural vocabulary. The expansion mode is a multimodal extension of the semantic scope and application scenarios of cultural vocabulary. These patterns are influenced by factors such as cultural background, disciplinary specificity, and authors' writing intentions. Based on the theory of semantic evolution and pragmatics, this paper explores the pragmatic evolution of cultural vocabulary in academic writing, which has the characteristics of gradual and staged. Social development, subject development, and language exposure are the main drivers. Multimodal corpora provides abundant data for the study of cultural vocabulary, but there are challenges such as high labor cost, difficult accuracy control and high technical requirements for data annotation. This study provides enlightenment for improving the quality of academic language writing and promoting the development of cultural vocabulary research.
Keywords: Multimodal Corpus; Academic Language Writing; Cultural Vocabulary; Synergistic Use; Pragmatic Evolution

1. INTRODUCTION

In today's era of rapid development of digitalization and informatization, the rise of multimodal corpora has brought revolutionary changes to academic language research. The traditional single-modal corpus mainly focuses on text data, while the multimodal corpus integrates text, image, audio, video and other modal data, which can more comprehensively and truly reflect the complexity and diversity of language in actual use. As scholar Hong Huaqing emphasized in the lecture "Construction and

Application of Multimodal Corpora", multimodal corpora provide a new perspective for language research, enabling researchers to analyze language phenomena from multiple dimensions. For example, in classroom teaching scenarios, the multimodal corpus can not only record the teacher's speech explanation (text and audio modality), but also capture the teacher's body movements, facial expressions (image and video modality), and students' classroom responses, which is of great significance for in-depth understanding of language use in teaching interaction (Paltridge, 2004).

With the increasing frequency of academic exchanges around the world, the importance of academic language as an important carrier of knowledge dissemination and exchange of ideas is self-evident. As a key component of academic language, cultural vocabulary carries the cultural connotation, values and ways of thinking of a specific nation or group, and plays a pivotal role in academic writing. Cultural vocabulary often contains profound cultural heritage, such as "yin and yang" and "five elements" in traditional Chinese culture, which are not only concise expressions of ancient Chinese philosophical thoughts, but also frequently appear in the writing of related academic fields (such as traditional Chinese medicine theory, ancient Chinese history research, etc.). The accurate use of these cultural vocabulary can not only enrich academic expression and enhance the cultural heritage of the article, but also help to spread the national culture in international academic exchanges and promote the exchange and understanding between different cultures. Improper use of cultural vocabulary in academic writing can lead to semantic misunderstandings, hinder the effective transmission of academic ideas, and even lead to cultural conflicts (Uccelli et al., 2013).

2. MULTIMODAL CORPORA AND THE THEORETICAL BASIS OF ACADEMIC LANGUAGE WRITING

2.1 Multimodal Corpus

The multimodal corpus is a product of the deep integration of information technology and linguistics, which breaks through the limitations of the traditional single-modal corpus that only uses text as the data source, and organically integrates the data of multiple modalities such as text, image, audio, and video. From the perspective of definition, scholar Zhang Xiaojun believes that multimodal corpora is based on speech theory, with speech activity as the research object, including language, sound, image and action; Gu Yueguo pointed out from the perspective of user

operation that the multimodal corpus integrates the processing of text, audio and static and dynamic image corpora, and users can multi-modal retrieval and statistics (Adolphs & Carter, 2013). The multimodal corpus has significant characteristics, diverse data sources, covers a variety of information media, and can present the real scene of language use in an all-round way, such as the multimodal corpus of historical and cultural lectures contains lecture scripts, on-site pictures, audio explanations and lecture videos. It is highly interactive, and users can search through text keywords, image features, audio content, etc., such as doctors in a medical multimodal corpus can obtain information in a variety of ways. In addition, it can truly reflect the complexity of language use, which is exemplified by the integration of multiple modal data to record the interaction of verbal and non-verbal information, as well as the analysis of business negotiation scenarios (Nasti et al., 2017). The development of multimodal corpora has been evolving, germinating in the 90s of the 20th century, when foreign countries took the lead in trying to build and focus on language-specific research. The 21st century has ushered in rapid development, the popularization of multimedia and the Internet, the convenience and scale of data acquisition, the continuous improvement of annotation technology, and the expansion of application fields, which have played a role in education, language research and other fields. In recent years, it has become increasingly important in cutting-edge fields such as natural language processing and artificial intelligence to support model training, image and speech recognition, and intelligent robot development (Du Toit, 2020). It has a wide range of applications, providing teachers with a variety of resources to create situations, stimulate interest, and assess ability in language teaching. In natural language processing, it supports tasks such as machine translation and intelligent question answering to improve accuracy and service intelligence. In the field of human-computer interaction, it helps to develop more natural and efficient interaction systems, so that machines can perceive users' emotional intentions, such as intelligent customer service systems.

2.2 Cultural Vocabulary in Academic Language Writing

Cultural vocabulary carries a specific cultural connotation, and the connotation goes beyond the literal meaning to reflect the cultural characteristics of a nation or group, such as history and values. Broadly speaking, it includes idioms that are closely related to culture, as well as various words with cultural symbolism, such as "breaking the kettle and sinking the boat" to reflect traditional Chinese cultural values (Nasiri,

2012). Cultural vocabulary can be divided into material cultural vocabulary from the level of cultural content, such as "porcelain", "silk" and "tea", reflecting the achievements of material civilization. Spiritual and cultural vocabulary, such as "God", "Heaven" and "Hell" in the West and "benevolence", "righteousness", "propriety", "wisdom" and "faith" in China, embody spiritual content such as ideological concepts; Institutional and cultural vocabulary, such as the ancient Chinese "imperial examination", "three provinces and six ministries" and the modern "market economy" and "democratic system", involve the social system level; Behavioral cultural vocabulary, such as traditional Chinese festival vocabulary, reflects daily life behaviors and customs (Cˇmejrková & Daneš, 1997). Cultural vocabulary plays an important role in academic writing, which can reflect the cultural characteristics of academic research, and the cultural perspectives and methods of academic research in different cultural backgrounds are displayed through cultural vocabulary, such as "Yin and Yang", "Five Elements" and "Dao" in traditional Chinese philosophical discourses and "existentialism" in Western philosophical research. It can also enrich the expression of academic language, and its rich semantic connotation and vivid image color add charm to academic language, and the use of cultural vocabulary in literature and historical research can delicately depict and enhance appeal. In addition, cultural vocabulary can promote cross-cultural academic exchanges, and in the context of globalization, scholars can accurately use cultural vocabulary to disseminate their own national culture and academic thoughts, and at the same time understand the use of foreign cultural vocabulary to grasp the connotation of foreign academic thoughts (Steinman, 2003).

3. CASE STUDY OF THE COLLABORATIVE APPLICATION OF CULTURAL VOCABULARY FROM THE PERSPECTIVE OF MULTIMODAL CORPUS

3.1 Case Selection and Study Design

This study follows the principles of typicality, relevance and sufficiency in the selection of cases to ensure that the cases are representative and have research value. Typicality requires that the selected cases fully reflect the characteristics of the use of Chinese vocabulary in academic language writing in different subject fields and the multimodal collaborative model. For example, in the field of medicine, academic papers expounding the theories of traditional Chinese medicine are selected, and in the field of

literary studies, academic reports on cultural interpretations of classical Chinese poetry are selected. The principle of relevance means that the case must be closely related to the research topic, for example, when studying the use of cultural vocabulary in cross-cultural academic communication, select papers and discussion records on the comparative study of different cultures in international academic conferences. Adequacy requires that the case contains a wealth of data and information that can be analyzed from multiple perspectives, such as selecting a longer and rich academic monograph (Gao & Wang, 2018). The cases come from a wide range of sources, including academic paper databases, academic reports, academic monographs, and academic conference discussion records. Screening academic papers through well-known academic databases such as CNKI, Wanfang Data, Web of Science, etc., participating in domestic and foreign academic conferences or online academic lecture platforms to collect academic reports, selecting representative academic monographs, and communicating with conference organizers to obtain conference discussion records (Lin, 2017). This study designed a comprehensive and detailed analytical framework to analyze the collaborative use of cultural vocabulary from the perspective of multimodal corpus from the modalities of text, image, and audio. Text modality is used to conduct word frequency statistics, part-of-speech analysis, and semantic classification of cultural vocabulary. Image modality analyzes image type, content, and association with cultural vocabulary; Audio modalities focus on audio content, intonation, speaking rate, and more. The data collection method mainly uses multimodal corpus tools and technologies, using text analysis software such as AntConc and WordSmith to process academic texts, analyzing images with the help of image recognition software such as Tesseract OCR and Adobe Acrobat, and using iFLYTEK speech recognition, Baidu speech recognition and other speech recognition software to process audio data. At the same time, professional linguistics researchers and domain experts are organized to manually annotate to ensure the accuracy and reliability of the data.

3.2 Case Study Process and Results

Case 1: Synergy between Chinese vocabulary and image modality in scientific and technological academic writing. Take an academic paper on quantum computing published in the top international scientific journal "Nature" as an example, which aims to illustrate the key role of qubit, a concept with profound cultural connotations, in quantum computing. As the core cultural vocabulary in the field of quantum computing, the unique

quantum characteristics of qubits contain the scientific ideas and theoretical systems of quantum mechanics in a specific cultural background. In this paper, in order to make readers better understand the abstract concept of qubits, the author uses a wealth of image modalities and cultural vocabulary to express them together (Nelson, 2006). When the author details the qubits in the text, he inserts a clear schematic diagram of the physical structure of the qubits (image modal). This image shows the basic building blocks of qubits, such as superconducting Josephson junctions, quantum dots, etc., which are closely aligned with the description of how qubits are physically implemented in the text. When the text mentions the key feature that "qubits are capable of being in a superposition state of 0 and 1 at the same time, based on the superposition principle of quantum mechanics", the physical regions representing the 0 and 1 states and the quantum superposition between them are highlighted in the image by different colors and callouts. This combination of pictures and texts allows readers to intuitively see the connection between the physical form of qubits and the abstract concept of quantum superposition, so as to more easily understand the connotation of qubits as a cultural vocabulary (Zhang et al., 2020). In this paper, dynamic images (video modalities) are used to further illustrate the operation process of qubits in quantum computing. The video shows the change of state of the qubit under the operation of the quantum gate, which echoes the description of the quantum algorithm and the operation of the quantum gate in the text. When the text explains how quantum gate operations change the state of qubits to enable quantum computing, the video shows the dynamic processes of qubits rotating and flipping under different quantum gates in the form of vivid animations. This multi-modal collaborative approach presents the abstract quantum computing process in an intuitive and dynamic form, which greatly reduces the difficulty of readers' understanding and enhances the communication effect of cultural vocabulary (Sydorenko, 2010). Through the analysis of this case, it is found that the synergy between cultural vocabulary and image modality can effectively reduce the difficulty of understanding abstract concepts in scientific and technological academic writing. The image modality provides intuitive visual support for cultural vocabulary, so that readers can better grasp the abstract scientific concepts represented by cultural vocabulary with the help of the concrete information of images. This collaborative approach helps to improve the readability and comprehensibility of academic papers, and promotes the dissemination and exchange of scientific and technological knowledge in the international academic

community. In the emerging and complex field of quantum computing, the synergy of cultural vocabulary and image modality can help researchers from different cultural backgrounds to explore and understand the mysteries of quantum computing across language and cultural barriers.

Case 2: Humanities and social sciences papers Chinese vocabulary and audio modal synergy. In a humanities and social science paper on the interpretation of the cultural connotation of classical Chinese poetry, the author deeply explores the use of "artistic conception", a word with strong Chinese cultural characteristics, in poetry and its cultural connotation. "Artistic conception" is one of the core concepts of classical Chinese aesthetics, carrying the unique aesthetic concepts and philosophical ideas in traditional Chinese culture. In order to better show the rich connotation and emotional expression of the cultural word "artistic conception", the author of the paper cleverly combines the audio modality (Ye et al., 2025). When analyzing the poems, the author selected a number of representative poems and provided audio recitations by professional reciters. When interpreting Wang Wei's "Autumn Twilight in the Mountain House", "After the new rain in the empty mountain, the weather is late in autumn. The artistic conception created by these poems, the reciter in the audio clearly reads every word in a soothing and melodious tone, and at the same time, through the rhythmic changes of the tone and frustration, vividly shows the fresh and quiet atmosphere of the autumn mountains and forests after the rain depicted in the poem. When reciting "Bright Moon and Pine Trees", the reciter slows down the speed of speech and accentuates the pronunciation of "Bright Moon" and "Pine Tree", so that the audience can seem to see the picture of the bright moonlight shining through the branches and leaves of the pine tree. When reciting "Clear Spring Stone Upstream", the tone is brisk, simulating the murmuring sound of the clear spring, so that the audience can really feel the agility and liveliness of the clear spring in the mountains. This audio recitation, combined with the text's analysis of the "artistic conception", allows the reader to feel the beauty of the artistic conception conveyed by the poem more deeply from an auditory perspective (Liu & Qu, 2014). The paper also inserted an audio explanation of the expert's interpretation of the poetic conception. In the audio, the experts elaborated on the embodiment of the cultural word "artistic conception" in "Autumn Dusk in the Mountain House", as well as the yearning and pursuit of nature and quiet life in traditional Chinese culture behind it. Experts pointed out that the images of "empty mountain", "bright moon", "pine", "clear spring" and "stone" in the poem are integrated with each other, creating an ethereal and quiet artistic

conception, reflecting Wang Wei's love for nature and his yearning for a leisurely life. This audio commentary provides readers with a more in-depth and professional cultural interpretation, which complements the textual analysis and helps readers better understand the rich connotation of the cultural vocabulary "artistic conception" in poetry. Through the analysis of this case, it can be seen that in the humanities and social sciences papers, the synergy between cultural vocabulary and audio modality can enhance the communication of cultural connotation and emotional expression. Audio recitation and expert explanation can mobilize the reader's auditory perception through the rhyme, rhythm and professional interpretation of the sound, so that the reader can more deeply experience the emotions and artistic conception contained in the Chinese vocabulary of the poem. This collaborative approach enriches the expression form of academic papers, provides a more vivid and three-dimensional cultural interpretation perspective for research in the field of humanities and social sciences, and helps to inherit and promote traditional Chinese culture (Shaojie et al., 2022).

Case 3: Collaboration between Chinese vocabulary and video modality in academic reports in the medical field. At an international medical academic conference, a medical expert from China gave an academic report on the principles of acupuncture and moxibustion treatment in traditional Chinese medicine, which fully demonstrated the synergy between cultural vocabulary and video modality in academic communication in the medical field. In the report, experts repeatedly mentioned words with traditional Chinese medicine cultural characteristics such as "meridians" and "acupuncture points", which are an important part of the theoretical system of traditional Chinese medicine and carry the unique theoretical and practical experience of traditional Chinese medicine (Chen et al., 2024). In order to allow participants from different cultural backgrounds to better understand cultural terms such as "meridians" and "acupuncture points", the experts showed a well-crafted video in the presentation. The video first shows a detailed map of the human body's meridian acupoints, gradually outlining the direction of the human body's meridians and the distribution of acupuncture points in the form of animation, which echoes the text content mentioned by the expert in the explanation, such as "the meridian system includes 12 meridians, 8 strange meridians, etc., which are connected to each other and constitute the channel for the operation of human body's qi and blood". Specific acupuncture points are highlighted in the video with different colors and flashing effects, allowing attendees to visualize the specific location of the acupuncture points on the human

body (Zhang et al., 2023). Subsequently, the video shows the actual acupuncture treatment process. In the picture, the doctor accurately inserts the acupuncture needle into the patient's acupuncture points, and performs appropriate manual operations according to the patient's condition, such as lifting and inserting, twisting, etc. The expert also described the principle of acupuncture treatment, "through acupuncture points, stimulate the operation of meridian qi and blood, regulate the balance of yin and yang in the human body, so as to achieve the purpose of treating diseases". The combination of clear visual display in the video and expert explanations enabled participants to witness the specific operation process of acupuncture treatment and better understand the practical application of cultural terms such as "meridians" and "acupuncture points" in acupuncture treatment (Pahune & Rewatkar, 2024). Through the analysis of this case, it is shown that the synergy between cultural vocabulary and video modality is of great significance to the dissemination of professional knowledge in academic reports in the medical field. The video modality can show the medical practice process in an intuitive and vivid way, and make up for the possible barriers to understanding cultural vocabulary in cross-cultural communication. For international participants who are not familiar with TCM culture, by watching the video, they will be able to have a clearer understanding of the principles and operation methods of TCM acupuncture treatment, so as to enhance their understanding of TCM cultural vocabulary and TCM theoretical system. This synergistic approach promotes the exchange and integration of different medical cultures, and helps to promote the spread and development of traditional Chinese medicine in the field of international medicine (Yan et al., 2024).

3.3 Collaborative Application Mode and Influencing Factors
3.3.1 Summary of Cultural Vocabulary and Multimodal Collaborative Application Mode

Through the in-depth analysis of the above cases, it can be concluded that there are multiple synergistic application modes between cultural vocabulary and multimodality. The complementary model is one of the important modes, in which cultural vocabulary complements other modal information and together conveys a complete meaning. In the case of scientific and technical academic writing, the concept of qubits is relatively abstract, and it is difficult for readers to fully understand it only through the description of cultural vocabulary in the text. The schematic diagram of the physical structure of the qubits in the image mode and the qubit operation process displayed in the dynamic image complement the cultural

vocabulary in the text. The image presents the physical form and operation principle of qubits in an intuitive visual form, which makes up for the abstract nature of the text description and enables readers to understand the connotation of qubits from different perspectives. In the case of humanities and social sciences papers, the rhyme and rhythm of audio recitation complement the description of the artistic conception of the poem in the text, so that the reader can feel the emotion and artistic conception conveyed by the poem from an auditory perspective. The reciter vividly shows the emotions and atmosphere in the poems through the modulation of the voice and the change of speech speed, which complements the analysis of "artistic conception" in the text and enhances the expression effect of cultural vocabulary (Ho et al., 2011). The reinforcement mode is also one of the common collaborative application modes, and multimodal information can strengthen the meaning and emotion expressed by cultural words. In the case of academic reports in the medical field, the acupuncture treatment process shown in the video strengthens the principle of acupuncture treatment in traditional Chinese medicine represented by cultural terms such as "meridians" and "acupuncture points" through vivid pictures and practical demonstrations. In the video, the doctor's accurate acupuncture technique, the positioning of acupuncture points, and the patient's treatment response enable participants to feel the effect of acupuncture treatment more intuitively, so as to deepen their understanding of the connotation of cultural words such as "meridians" and "acupuncture points" (Hansen, 2024). In the case of scientific and technological academic writing, the display of the qubit operation process in dynamic images reinforces the key role of qubits in quantum computing through animation effects and color changes, so that readers can have a deeper understanding of the scientific concepts expressed in cultural vocabulary. The expansion mode is another important mode for the collaborative use of cultural vocabulary and multimodality, and multimodal information can expand the semantics and cultural connotation of cultural vocabulary. In the case of the humanities and social sciences dissertation, the expert's audio explanation of the interpretation of the artistic conception of the poem not only explains the basic meaning of the cultural word "artistic conception" in the poem, but also deeply explores the yearning and pursuit of natural and quiet life in the traditional Chinese culture contained behind it. This audio commentary expands the cultural connotation of the cultural word "artistic conception", allowing readers to understand its meaning in a broader cultural context. In the case of science and technology writing, the schematic diagram of the physical

structure of qubits in the image mode and the qubit operation process displayed in dynamic images not only show the basic concept of qubits, but also expand their application and development prospects in the field of quantum computing and other semantic information, so that readers can understand the cultural vocabulary of qubits more comprehensively and deeply (Ntelioglou et al., 2014).

3.3.2 Analysis of Factors Influencing the Synergistic Use of Cultural Vocabulary

The collaborative use of cultural vocabulary from the perspective of multimodal corpus is affected by many factors. Cultural context is the primary factor, and cultural vocabulary in different cultural backgrounds has unique connotations and semantics, and there are also differences in the way of coordination with multimodal information. In Oriental culture, cultural vocabulary often contains rich metaphors and symbolic meanings, and the synergy with modal information such as images and audio pays more attention to the creation of artistic conception and the expression of emotions. In classical Chinese poetry, the cultural word "plum blossom" often symbolizes noble and tenacious qualities, and in the audio of the poetry recitation, the reciter will create a quiet and elegant atmosphere through the change of intonation, speed of speech, and the choice of soundtrack, echoing the cultural connotation of "plum blossom". In Western culture, cultural vocabulary emphasizes more logic and science, and the synergy with multimodal information focuses on the accurate communication of information and the clear presentation of logic. In the field of Western medicine, the cultural vocabulary about disease diagnosis and treatment will be accurately explained and explained through detailed medical images, data charts and other multimodal information to ensure the accuracy and scientific of the information (Ojomah, 2017). The characteristics of the discipline also have an important impact on the collaborative use of cultural vocabulary. The cultural vocabulary of different disciplines has different professional attributes and semantic characteristics, and its synergy with multimodal information needs to meet the needs of the discipline. In the field of natural sciences, cultural vocabulary usually has precise scientific definitions and professional terms, and the coordination with modal information such as images and videos are mainly to visually demonstrate scientific principles and experimental processes. In physics, the cultural vocabulary of "relativity" will show its theoretical model and experimental verification process through multimodal information such as animation demonstrations and

experimental videos, so as to help readers understand complex scientific concepts. In the field of humanities and social sciences, cultural vocabulary pays more attention to cultural connotation and emotional expression, and the synergy with audio, text and other modal information aims to convey thoughts, emotions and cultural values. In the study of literature, the analysis of the characters in literary works will combine multimodal information such as audio recitation and text interpretation to dig deep into the cultural significance and emotional value contained in the characters (Dinh, 2022). Author's intention is also a key factor influencing the synergistic use of cultural vocabulary. When authors use cultural vocabulary and multimodal information in academic writing, they often have clear intentions, such as conveying professional knowledge, expounding academic opinions, and provoking readers' thinking. In order to achieve these intentions, the author chooses the appropriate cultural vocabulary according to the specific purpose of the writing and skillfully synergizes it with the multimodal information. In an academic paper on cultural inheritance, in order to emphasize the importance of traditional culture, the author may use cultural terms such as "traditional festivals" and "folk art", combined with relevant pictures, videos and other multimodal information to show the charm and value of traditional culture, so as to arouse readers' attention and thinking about cultural inheritance. If the author's intention is to introduce a new scientific theory, then relevant scientific and cultural vocabulary will be selected and elaborated and demonstrated in detail through multimodal information such as charts and experimental data to accurately convey scientific knowledge (Alcalay).

4. EXPLORATION OF THE PRAGMATIC EVOLUTION OF CHINESE VOCABULARY IN ACADEMIC LANGUAGE WRITING

4.1 Theoretical Basis for the Pragmatic Evolution of Cultural Vocabulary
 4.1.1 Semantic Evolution Theory
    Semantic evolution theory is an important theoretical system for studying the change of lexical meaning, which provides a solid foundation for in- depth understanding of the pragmatic evolution of cultural vocabulary in academic language writing. Semantic evolution mainly covers the expansion, contraction, and transfer of word meaning. Word meaning expansion refers to the gradual expansion of the scope of meaning of words in the process of evolution, and the scope of the referred object is constantly expanding. Take the words "river" and "river" as an example, in

ancient times, "jiang" specifically referred to the Yangtze River, and "he" specifically referred to the Yellow River. Over time, their meaning gradually expanded, and "river" now refers to all large rivers, and "river" is no longer limited to the Yellow River, but has become a common term for rivers. A similar phenomenon exists in academic language writing, such as the word "information", which originally mainly referred to news and audio. In the information age, its meaning has been greatly expanded, covering all kinds of data, knowledge, signals and other content. In academic papers in the field of computer science, "information" often involves the storage, transmission, processing and other aspects of data, and its semantic scope goes far beyond the original meaning (Rubio-Fernandez, 2024). Word meaning narrowing, as opposed to word meaning expansion, refers to the gradual narrowing of the scope of meaning of words in the process of evolution, and the scope of the referred object becomes more specific and narrower. In ancient times, "tile" was the "general name for the burned earthenware", covering all kinds of fired earthenware. In modern times, "tile" mainly refers to the kind of burnt earthenware that is covered on the roof, and its scope of meaning is significantly narrower. In academic language, some cultural words also have a phenomenon of word meaning reduction. The word "feudal", in ancient China, "feudal" refers to the political system of feudal statehood, which is a broad social and political form. In the modern academic context, "feudal" is more used to describe the specific stages and characteristics of feudal society, and its semantic scope is relatively narrow. In historical research, scholars often use the word "feudal" to clearly define its meaning in a specific historical period to avoid semantic confusion (Grundy, 2007). Word meaning transfer refers to a fundamental change in the meaning of a word in the process of evolution, from the original referent to a different object. The word "sacrifice" in ancient times referred to sacrificial or sacrificial objects, usually whole animals of solid color, such as cattle, sheep and pigs. Over time, the meaning of "sacrifice" has gradually shifted, and now it mainly refers to the sacrifice of one's own life for the sake of justice, or the renunciation of certain interests. In academic language writing, the phenomenon of word meaning transfer is also common. The word "revolution", in ancient China, "the king changed his surname to revolution", mainly refers to the change of dynasties and the transfer of political power. In modern times, with the intensification of social change, the meaning of "revolution" has shifted significantly, and the oppressed class has violently seized power, destroyed the old and decadent social system, and established a new progressive social system called "revolution".

In academic research in the fields of politics and sociology, "revolution" has become an important concept, and its connotation and extension have undergone profound changes (Scott-Phillips, 2009).

4.1.2 Pragmatics Related Theories

Pragmatics theories provide a unique perspective and analytical framework for exploring the pragmatic evolution of cultural vocabulary. Contextual theory is an important foundation of pragmatics, which emphasizes that the meaning of language depends not only on the words themselves, but also on the context in which the language is used. Contexts include linguistic and non-linguistic contexts. Linguistic context refers to the context, i.e., the context in which a word or sentence is placed in a text. In academic language writing, the meaning of cultural vocabulary often needs to be understood accurately according to the context. In an academic paper on ancient Chinese philosophy, the meaning of the cultural word "Tao" needs to be determined in context. In the context of discussing Taoist thought, "Dao" usually refers to the core concept of Taoism, which is the root and ontology of all things in the universe. In other contexts, the meaning of "Tao" may be different. Non-verbal contexts include the identity, background, cultural traditions, and social environment of the communicator. Different cultural backgrounds can lead to differences in the understanding and use of vocabulary in the same culture. In Western culture, the "dragon" is often seen as a ferocious, evil creature. In Chinese culture, the dragon is a symbol of good fortune, authority and strength. In international academic exchanges, if we do not consider the differences in cultural backgrounds, we may misunderstand the two cultural terms "dragon" and "dragon", which will affect the effectiveness of academic exchanges (Sweetser, 1990). The principle of cooperation is also one of the important theories of pragmatics, which was proposed by the American philosopher Grice. The principles of cooperation include quantitative criteria, qualitative criteria, relationship criteria and modal criteria. Quantity guidelines require that the speaker provide the right amount of information, neither too much nor too little. In academic language writing, the writer needs to provide an appropriate number of explanations and explanations about cultural vocabulary according to the specific context and expression needs when using cultural vocabulary. If the explanation of cultural vocabulary is too simplistic, it may make it difficult for the reader to understand its meaning; If the explanation is too cumbersome, it may affect the readability of the article. The quality guidelines require that the

information provided by the speaker be truthful and reliable. In academic research, the use and interpretation of cultural vocabulary must be based on accurate documentary materials and in-depth research to ensure the authenticity and credibility of the information. Relational guidelines require that the speaker's words be relevant and to the point. When using cultural vocabulary, the writer needs to make sure that it is closely related to the topic and content of the article, and that it is not irrelevant or off-topic. The style guidelines require the speaker to express themselves clearly, concisely, and in an organized manner. When explaining and using cultural vocabulary, writers should try to use plain language and avoid using overly obscure terms and expressions to improve the readability and comprehensibility of the article (Nungesser, 2017).

4.2 Case Study of Pragmatic Evolution of Cultural Vocabulary

4.2.1. The Lexical Evolution from Ancient Academic Literature to Modern Academic Writing

Take the word "feudal" as an example, in ancient Chinese academic literature, "feudal" originally referred to the political system of feudal statehood. The feudal system implemented in the Western Zhou Dynasty was a typical feudal system, in which Zhou Tianzi divided the land and people to the princes, who enjoyed relatively independent political, economic and military power in their own feudal countries. In ancient historical documents such as Zuo Chuan and Shiji, the word "feudal" appears frequently to describe this political system. It is recorded in "Zuo Chuan and the Twenty-fourth Year of the Duke of Xu": "In the past, the Duke of Zhou hung. The second uncle and was not salty, so the feudal relatives took the Ping Zhou." The word "feudal" here explicitly refers to the political move of dividing the vassals to defend the Zhou dynasty (Rubio-Fernandez, 2024). With the development of history, the semantics of "feudal" have gradually evolved in different historical periods. In modern times, with the introduction of Western culture and the transformation of Chinese society, the word "feudal" has been given a new meaning. Under the influence of Marxist theory, "feudalism" was used to describe a social form, that is, feudal society, which is a specific stage in the development of human society, with specific production relations and class structure. In the academic writing of this period, the semantics of "feudal" were more abstract and theoretical, emphasizing the economic basis of feudal society, class contradictions, etc. In Mao Zedong's "The Chinese Revolution and the Communist Party of China", he expounded in detail the characteristics of China's feudal society, pointing out that the main

contradiction in China's feudal society was the contradiction between the peasant class and the landlord class, and the feudal land ownership system was the economic foundation of feudal society (Grundy, 2007). In modern academic writing, the semantics of "feudal" have evolved further. In addition to being used to describe the related concepts of feudal society in history, sociology and other disciplines, "feudalism" is often used as a metaphor for the conservative and backward ideas and concepts. In the field of cultural studies, when criticizing certain traditional concepts or behaviors as conservative and backward, expressions such as "feudal thought" and "feudal consciousness" are used. In some studies on the status of women, the traditional concept of "male superiority and inferiority of women" will be criticized as a remnant of feudal thinking, which restricts the development of women and is contrary to the concept of equality and freedom in modern society. From ancient academic literature to modern academic writing, the semantic and pragmatic functions of the word "feudal" have changed significantly. Semanticly, it has gradually evolved from the concept of a concrete political system to an abstract concept of social form, and then to a metaphorical description of ideas and concepts. In terms of pragmatic function, it is mainly used in ancient times for historical narration and elaboration of political systems, in modern times for the analysis of social forms and the construction of revolutionary theories, and in modern times it is widely used in cultural criticism and analysis of social phenomena. This evolution reflects the changes in social history, the exchange and integration of cultures, and the development and deepening of academic research (Zamira, 2021).

4.2.2 Differences in the Pragmatic Evolution of Cultural Vocabulary in Different Subject Areas

In the field of medicine, the pragmatic evolution of the cultural word "meridian" has a unique trajectory. In traditional Chinese medicine theory, the "meridians" are the channels through which qi and blood flow, including. The 12 meridians and the 8 strange meridians, which are an important theoretical basis for the diagnosis and treatment of diseases in Chinese medicine. In the ancient Chinese medicine classic "The Yellow Emperor's Neijing", the discussion of the meridian system is very detailed, such as "the meridians, so they can decide life and death, deal with all kinds of diseases, adjust the void and reality, and it is indispensable". At this time, the pragmatics of "meridians" mainly focus on the theoretical elaboration and clinical practice of traditional Chinese medicine, which is used to explain the physiological and pathological phenomena of the human body

and guide acupuncture, massage and other treatment methods (Pishghadam et al., 2020). With the development of modern medicine, the pragmatic of the word "meridian" in the field of medicine has changed. On the one hand, in the modern research of traditional Chinese medicine, "meridians" have become an important research object, and scientists have used modern scientific and technological means, such as bioelectric detection, imaging, etc., to conduct in-depth research on the material basis and physiological functions of meridians. In this process, the pragmatics of "meridians" have expanded from traditional theoretical elaboration and clinical practice to the field of scientific research, which is used to describe and explain relevant experimental phenomena and research results. On the other hand, in the academic exchange of integrated traditional Chinese and Western medicine, the "meridians" need to be docked and integrated with the concepts and theories of modern medicine. When discussing the therapeutic effect of TCM acupuncture on neurological diseases, it is necessary to link the "meridians" with the concept of the nervous system in modern medicine, and explain the scientific nature of the meridian theory in the language of modern medicine. In the field of literature, the pragmatic evolution of the cultural word "image" is very different from the "meridian" in the field of medicine. In ancient literary criticism, "imagery" refers to the objective image that integrates the author's subjective emotions, and is an important means to express emotions and artistic conception in poetry, prose and other literary works. Liu Xian's "Wenxin Carving Dragon: Divine Thought" mentions that "the craftsman who shines alone, peeps at the image and carries the Catty", emphasizing the importance of imagery in literary creation. At this time, the pragmatic use of "imagery" is mainly used for the appreciation and criticism of literary works, helping readers understand the connotation and artistic characteristics of the work (Scott-Phillips, 2009). With the development of literary theory, the pragmatics of "imagery" have been expanded. In modern literary theory, "imagery" is not only an important concept in literary creation and criticism, but also has a connection with psychology, philosophy and other disciplines. In the field of psychology, "imagery" is used to study human cognitive and emotional expressions, considering imagery to be a manifestation of human mental activity. In the field of philosophy, "imagery" is combined with philosophical currents such as phenomenology and existentialism to explore human perception and understanding of the world. In literary studies, scholars use these interdisciplinary theories and methods to conduct more in-depth research

on "imagery", and the pragmatics of "imagery" have expanded from simple literary appreciation to interdisciplinary theoretical discussion. There are significant differences in the pragmatic evolution of cultural vocabulary in different subject areas. The evolution of cultural vocabulary in the field of medicine is often closely related to the development of science and technology and the needs of clinical practice, focusing on the scientific and practical nature of vocabulary. The evolution of cultural vocabulary in the field of literature is more influenced by the development of literary theory, cultural trends and interdisciplinary research, emphasizing the cultural connotation and aesthetic value of vocabulary. Although there are differences in the pragmatic evolution of cultural vocabulary in different subject areas, there are also some commonalities. They are all influenced by socio-cultural contexts and evolve with the times. In the process of academic exchange and integration of different disciplines, the pragmatics of cultural vocabulary will also affect each other, showing a certain phenomenon of intersection and infiltration (Benítez‐Burraco et al., 2021).

4.3 Pragmatic Evolution and Driving Factors
4.3.1 Summary of the Pragmatic Evolution of Cultural Vocabulary
   The pragmatic evolution of cultural vocabulary is distinctly gradual. This process does not happen overnight, but gradually over a long period of time with the language. Taking the word "culture" as an example, in ancient Chinese, "culture" mainly refers to "cultural governance and education", emphasizing the use of etiquette, morality and other spiritual aspects to influence and govern the people. It is mentioned in "Shuo Yuan Zhiwu" that "the prosperity of all martial arts, in order to disobey it, the culture will not change, and then it will be punished." This is what "culture" means here. With the development of society and the deepening of people's cognition, the meaning of "culture" has gradually been enriched and expanded. In modern times, "culture" not only includes the spiritual content, but also covers the sum of the material and spiritual wealth created by human society, such as literature, art, science, education, religion and other fields. This evolution is a slow, gradual accumulation process, which reflects the semantic continuity and expansion of cultural vocabulary in different historical periods (Hoefler, 2009). The pragmatic evolution of cultural vocabulary is also characterized by stages. In different historical periods, due to the influence of social, cultural, technological and other factors, the semantic and pragmatic functions of cultural vocabulary will

undergo phased changes. During the Industrial Revolution, with the popularization of machine production and the establishment of the factory system, a series of cultural words related to industrial production appeared, such as "factory", "machine", "worker" and so on. These words had specific semantic and pragmatic functions in the social context of the time, and were mainly used to describe the scenes, methods, and participants of industrial production. With the advent of the information age, the rapid development of computer technology and the Internet has given birth to new cultural terms, such as "Internet", "computer", "information superhighway", "cloud computing" and so on. The emergence of these words marks that the pragmatics of cultural words have entered a new stage, and they carry the cultural connotations and values of the information age in the new social context (Benítez‐Burraco et al., 2021). There is still a repetition in the pragmatic evolution of cultural vocabulary. In the process of evolution, the semantic and pragmatic functions of certain cultural words may recur or regress. The word "economy" in ancient Chinese mainly refers to "helping the people through the world" and "governing the country", which is quite different from the meaning of "economy" in modern economics. In modern times, with the introduction of Western economic theories, the word "economy" has been given a new meaning, mainly referring to the activities of social material production and reproduction. However, in some specific contexts, "economy" still uses its ancient meaning, such as "economic talent" and "economic prosperity", "economy" still emphasizes the ability to govern the country and help the people. This repetition of semantics reflects the close connection between cultural vocabulary and traditional culture in the process of evolution, as well as the diversity and flexibility of language use (Krassilov, 2014).

4.3.2 Discussion on the Factors Driving the Pragmatic Evolution of Cultural Vocabulary

Social development is one of the important factors driving the pragmatic evolution of cultural vocabulary (Cosentino, 2014). With the progress and change of society, new things, concepts and concepts are constantly emerging, which will inevitably lead to changes in the semantics and pragmatic functions of cultural vocabulary (Adornetti, 2015). In modern society, with the increasing awareness of environmental protection, the semantic and pragmatic functions of the word "green" have been greatly expanded. In addition to the original meaning of color, "green" is now often used to denote concepts such as environmental protection and

sustainable development, such as "green food", "green energy", "green building", etc. These new usages reflect society's concern for environmental protection and sustainable development, and are a linguistic reflection of social development (Rubio-Fernandez, 2024). The development of the discipline has also had an important impact on the pragmatic evolution of cultural vocabulary. The research in different disciplines is constantly deepening and expanding, and new theories, methods and concepts are constantly emerging, which promotes the evolution of the semantic and pragmatic functions of cultural vocabulary in the disciplinary context. In the field of psychology, with the development of cognitive psychology, the meaning and usage of the word "cognition" have been further enriched and refined. In traditional psychology, "cognition" mainly refers to the mental processes of an individual's perception, memory, and thinking of the external world. In cognitive psychology, "cognition" not only includes these basic mental processes, but also involves the processing, storage, extraction and application of information. This evolution is the shaping and influence of the development of disciplines on the semantic and pragmatic functions of cultural vocabulary. Language contact is another important driver of the pragmatic evolution of cultural vocabulary. With the development of globalization, the communication and integration between different languages are becoming more and more frequent, which makes cultural vocabulary borrow, spread and evolve between different languages. In English, Chinese cultural vocabulary such as "Kung Fu", "Tai Chi" and "Feng Shui" are gradually accepted and used, which not only retain the original cultural connotation in the English context, but also integrate the English language habits and expressions. Similarly, words such as "sofa", "coffee" and "bus" in English have been introduced into the Chinese language and have gradually become part of the everyday vocabulary of the Chinese language. This kind of linguistic contact and vocabulary borrowing enriches the semantic and pragmatic functions of cultural vocabulary and promotes the communication and integration between different cultures.

5. CONCLUSIONS

With the help of multimodal corpus, this study deeply explores the collaborative use and pragmatic evolution of Chinese vocabulary in academic language writing, and has achieved important results. In terms of the collaborative use of cultural vocabulary, through the analysis of a

number of typical cases such as scientific and technological academic writing, humanities and social science papers, and academic reports in the medical field, it is revealed that there are three synergistic application modes of cultural vocabulary and multimodal information: complementary, strengthened and expanded. For example, in scientific and technological academic writing, the introduction of qubits in papers in the field of quantum computing combines text descriptions with schematic diagrams of physical structures and computational dynamic images to reflect complementary modes. When the humanities and social sciences paper analyzes the "artistic conception" of classical Chinese poetry, the audio recitation and text description cooperate with each other, which is the reinforcement mode. The academic report in the medical field explains the principle of acupuncture treatment of traditional Chinese medicine, and the video shows the connotation of cultural words such as "meridians" and "acupuncture points", which belongs to the expansion mode. These models provide specific guidance for academic writers to use cultural vocabulary combined with multimodal information, which helps to improve the accuracy and richness of academic expression. In terms of the pragmatic evolution of cultural vocabulary, starting from the theory of semantic evolution and pragmatics, this paper analyzes the evolution of Chinese vocabulary from ancient academic literature to modern academic writing, and concludes that it has gradual, phased and repetitive laws. Taking the word "feudal" as an example, in ancient times, it referred to the political system of feudal statehood, and in modern times, it was influenced by Marxist theory to describe the feudal social form. The word "economy" has both modern economic connotations in different contexts, but also retains ancient meanings such as "helping the people through the world", reflecting its repetition. The study also explores the driving role of factors such as social development, disciplinary development, and language contact on the pragmatic evolution of cultural vocabulary. This study has important implications for the study of academic language writing and cultural vocabulary: in academic language writing, the rational use of multimodal means to collaborate with cultural vocabulary can enhance the readability and attractiveness of articles, and help readers better understand knowledge; Understanding the pragmatic evolution of cultural vocabulary can avoid misunderstandings and obstacles in international academic communication. From the perspective of cultural vocabulary research, multimodal corpora provides new perspectives and methods for research, which is helpful to analyze the semantic, pragmatic and cultural connotations of cultural vocabulary from multiple dimensions. The

revealed law of pragmatic evolution provides an empirical basis for the development of lexical semantics, pragmatics and other disciplines, and promotes the in-depth development of linguistic research.

6. ACKNOWLEDGEMENTS

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