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Cross-cultural Communication of Ancient Chinese Astronomical and Calendar from the Perspective of Multimodal Cognitive Discourse Analysis

-- A Case Study of The 24 Solar Terms of the Saying

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Abstract: Cultural soft power plays an increasingly crucial role in the international competition. Therefore, how to effectively spread 24 Solar Terms culture has become one of the main focuses for cultural scholars. The paper is based on the multimodal cognitive analysis, and it interprets the clip video Saying China Festival which enjoys a great popularity in overseas cultural communication. Various modalities including image, colour and sound reflect three levels of 24 Solar Terms culture: material, behavior and spirit levels, shaping the image of ancient Chinese culture through metaphor and metonymy. Relying on the results of the investigations, several practical suggestions of the cross-cultural communication are put forward: First, we ought to make use of the overlapped schemata to reduce the influence caused by the cultural differences, nonverbal modalities could be used frequently. Then, the stimulus of the overseas audience's recognition of traditional Chinese cultural through emotional mechanisms is also a reasonable choice.

Keywords: Cross-cultural Communication; Multimodality; Metaphor; Empathy; 24 Solar Terms.

1. Introduction:

In the ancient time, China took the pioneer role in the development of astronomy, which could be date back to the primitive society. In the Qin and Han dynasties, a relatively complete system based on calendar and celestial observation was formed. The calendar was an essential part of astronomy in ancient China, and the 24 solar terms was a prominent achievement achieved by the intelligent working people. It has practical significance for observing the change of seasons and climate, guiding agricultural production activities, and promoting the harmonious relationship between human and nature. In November 2016, UNESCO added China's declaration of "The 24 Solar Terms——the system of Time Knowledge formed by the Chinese people through observing the annual movement of the Sun and its practice" to the UNESCO Representative List of the Intangible Cultural Heritage of Humanity, which has become the important symbol for the world to recognize China. Then, the inheritance and innovation of Chinese traditional culture is weighted by 20th National Congress of the Communist Party of China. As the 24 solar terms acted as the typical example, there is no denying that the academic terrain focuses on the communication and promotion, strengthening the inheritance and protection of it. On the basis of the representative document: *The 24 Solar Terms of the Saying China Festival*, this article studies the spread of the 24 solar terms under the framework of multimodal cognitive discourse analysis and sociology of scientific knowledge to explore the regularity and essence of the ancient Chinese wisdom, attempting to provide new experiences and structure to intensify the influence of the transitional culture.

2. Literature Review

From the perspective of systemic functional grammar, Halliday (1978) studies language as a semiotic resource, upholding language is one of its categories. His theories establish a theoretical framework for multimodal discourse analysis. According to Kress and Leeuwen (2001), multimodality refers to the process of constructing meaning through the use of multiple semiotic modes, which indicates the connection between various modes in the communication. Multimodal cognitive discourse analysis attaches much importance to the meaning construction in media process, The scholars like Zhu Yongsheng (2007) upholds that metaphor and metonymy act as essential mechanism for people to understand the world, express thoughts and organize the meaning. Metaphor and metonymy are ubiquitous that not only exist in the language, but also in the image, gesture, sound and colour etc. Therefore, they could reflect cultural meaning, social meaning, and author's attitude. On the one hand, metaphor is considered as a mapping from familiar and concrete source domain to unknown and abstract target domain. On the other hand, metonymy refers to the proximity of one concept to the other one, which provides psychological accessibility to the cognition. According to Lakoff, G. & M. Johnson (1980), metaphor and metonymy depend on people's embodied experience and cognition of the physical world, which are also deeply affected by cultural environment, social customs and other factor expressing regional characteristics. Implicit metonymy is based on the cultural conventions formed by the cognitive experience of the nation in all language of the world, and it jointly acts on the construction of the language meaning. Next, Ungerer & Shmidt (1996) summarized nine basic types of metonymies in an introduction to Cognitive Linguistics, such as part-whole, container-content and material-object etc. Therefore, it could be concluded that both metaphor and metonymy share the function of expressive meaning and social criticism, and they could be used to construct the social meaning of the discourse and express the value and attitude of the author. In order to

serve the country's strategy, domestic scholars have explored the practical medium to promote Chinese culture to the world and strengthen the soft power of it. Zhao Xiufeng (2010) systematically studied and evaluated foreign research on multimodal metaphor, and since then there has been a lot of researches on it based on various materials, including posters, advertisements documentaries, comic and movies etc. For instance, Pan Yanyan (2020), Chen Fenghua (2021) et al. took China's national image as the research object and explained the significance of building a positive national image. Nevertheless, up to now, researches on the meaning constructions of multi-modal discourses with scientific themes in traditional Chinese culture are relatively limited. Therefore, with the support of the theoretical framework proposed by Forceville, the paper explores the constructions on cross-cultural communication of 24 solar terms, so as to find how the short clips build China's national image and provide feasible suggestions for telling Chinese stories well.

3. Overview of the Discourse

The discourse is selected from the Festive China, a series of short clips produced by China Daily. It concretes on the traditional Chinese festivals and festivities. The producer made full advantage of animation to manifest ancient Chinese astronomical and calendar culture. It is obvious that short video is a concise and vivid way to explain the long history of the extensive and profound traditional Chinese culture. In addition, the producer also highlights the modern value of the 24 solar terms. The series of short clips build a bridge between traditional civilization and modern science like astronomy, geography, agriculture and biology etc., which makes it more comprehensible and acceptable to the audience. The series have received 904,000 views and 34,000 likes on Bilibili, reflecting the high popularity. At the same time, the foreign social application like Instagram also receives a great amount of positive feedback and comments. The paper mainly focuses on the first episode 24 Solar Terms. Generally, it could be divided into four parts. The time modes and main contents of each part is illustrated in the following table 1. Firstly, the short clip presents the names of the 24 solar terms and their geographical significance. It affirms its significance in guiding people to adapt the environment and carry out the agricultural production, and becomes the weather vane of folk culture.

Table 1. Overview of the Discourse

Content/Part	Time modes	Main contents
First Part	00:00—00:50	Brief introduction, history and values of 24 solar terms
Second Part	00:51—02:03	The names of 24 of solar terms and their connections with astronomy and geography
Third Part	02:04—02:45	The practical application of 24 of solar terms, including agricultural guidance and Chinese folk customs
Four Part	02:45—04:10	The 24 solar terms shaping the spirit of contemporary Chinese people

In the new era of China, with people's deeper understanding of traditional culture, this ancient time system has gained new charm and vitality. Cultural products inspired by the 24 solar terms have emerged, involving innovative cooking and design. More importantly, 24 solar terms are a common cognitive system in China. That's the emotional bond reflecting the great wisdom and the harmonious relationship with the nature.

4. Research Design

4.1. Research Questions

In this paper, we try to have a comprehensive understanding of the current situation of the commodification of the 24 solar terms culture. This study attempts to revel the answers to the following three question from the domestic perspective.

1) What is the overall situation of students' learning and knowledge of 24 solar terms?

2) What are the potential problems in the cross-cultural communication of 24 solar terms?

3) Are there any practical suggestions to improve the circumstance?

The whole questionnaire is designed into two sections, including 12 multiple-choice questions and two rating questions. Question 1 to 7 aim to know the current learning circumstance of 24 solar terms; Questions 8 to 14 are related to student's attitudes toward the communication of 24 terms culture. Through the analysis the results of the questionnaire and survey, the analysis of the potential problems and practical suggestion would be conducted.

4.2. Participants

Eight English majors from West Anhui University were selected into the pilot study to find out the shortcomings of the questionnaire and revise it according to their feedback. Participants in this questionnaire survey were 141 students randomly selected from University of Shanghai for Science and Technology in Shanghai City. The Chinese version of the questionnaire will be sent to each participant to do it in their spare time. After completion, the questionnaire will be taken back from the participants as soon as possible to prevent loss.

4.3. Research Instruments

Aiming to obtain the correct the information and ensure the accuracy of the study results, the following steps ought to be followed: On the basis of the relevant questionnaire, a questionnaire about the cross-cultural communication of 24 solar terms is designed, which includes students' thinking, knowledge, values and existing problems. A total of 150 questionnaires were distributed, 145 were returned and 141 were valid. In the next chapter, the results would be the reference for the different levels constructions on cross-cultural communication of 24 solar terms.

4.4. Results and Analysis

The investigation reflects that many students are lack of the systematic knowledge about the solar term. The third question required the participant to choose the right description about the relationship between the environment and 24 solar terms. Only 35.21% of them chose the right answer. At the same time, there are about 25.35% of students who don't know the 24 solar terms has been listed to Intangible Cultural Heritage of UNESCO. Nevertheless, according to the sixth and seventh question, it could be concluded that about 90% of them feel satisfied about the opening ceremony of the Beijing Winter Olympics that is about 24 solar terms, and 85.81% of students attach great importance to the inheritance and innovation of it. Frankly speaking, the results reflect that many students

express the strong desire to acquire the knowledge about the 24 solar terms, but due to the time, energy or other reasons, the understanding of it relatively limited, so as the essence of the 24 solar terms is unavailable. Then, the tenth question reveals the existing obstacles of the cross-cultural communication. Almost 50% of them agreed that it's high time that strengthened the innovation in forms and the relationship with the daily life. Considering the circumstance, the multimodality is a reasonable method to promote the situation and construct the cross-cultural communication of 24 solar terms.

5. Constructions on Cross-cultural Communication of 24 Solar Terms

Lakoff, G. & M. Johnson have proposed that people's thinking and codes of conduct are fundamentally metaphorical. According to conceptual metaphor theory, it is believed that metaphor is a systematic mapping from a concrete conceptual domain to an abstract conceptual domain. Based on the conceptual metaphor theory, Forceville defined the multimodal metaphor as the mapping between two or several modes of the target domain and source domain. Next the paper mainly focuses on the cross-cultural communication of 24 solar terms from the perspective of multimodal discourse analysis, which is divided into three levels respectively, including material level, behavior level and spiritual level.

5.1. Material Level

The material level of 24 solar terms is rich and colorful, including poetry, painting, cuisine, music, dance and traditional crafts etc. Moreover, it has a close relationship with traditional festivals such as the Spring Festival, Dragon Boat Festival, Mid-Autumn Festival and traditional folk customs. With the prevalence of Chinese traditional culture in recent years, the 24 solar terms express its vigor and vitality in a variety of forms. The objects and events mentioned above are the material basis of the 24 solar terms cultural transmission. Firstly, in the first clip of Festive China, the commentator said that based on the observation of the movement of the sun, the ancient Chinese created an overall framework to mark the passage of time once a year, called the 24 solar terms. In the field of international meteorology, it is known as "China's fifth great invention". From the short clip, there is no denying that the audience could understand the 24 solar terms are a complete set of astronomical calendar system formed based on observation, which is based on the natural world and reflects the knowledge and experience formed by the working people in ancient China. In addition, the video shows the cultural symbols: The Forbidden City and the sundial (Fig 1).



Fig 1. The Forbidden City and the sundial

In visual mode, the Imperial Palace as the most representative architecture in China is majestic, symmetrical and reflects the hierarchy that all strengthen the narrative subject in the discourse. In addition, the sundial is a tool used by ancient Chinese people to measure time by the shadow of the sun that has a history of thousands of years and is complementary to the 24 solar terms. Through these images, the material world of ancient Chinese astronomy and calendar culture is natural and based on the wisdom and practice. Four great inventions enjoy a great reputation in the universe that foreigners are familiar with as the source domain, understanding the culture of the 24 solar terms in the target domain (the fifth invention in China). It reflects metaphorical thinking and cultural empathy from the perspective of cross-cultural communication. Then, the rational application of multimodality means conforms to the modern cultural trend, and the medium the public acquires information also contains the metaphor and metonymy of traditional culture, which could effectively change the stereotype of the 24 solar terms, promote its innovative development, and facilitate its worldwide dissemination. Although the culture reflects the regionalism of Chinese culture, it contains all the positive elements in human cognition. Only by creating a culture of the 24 solar terms that meets the needs of people all over the world can better promote Chinese culture to the world. For instance, the culture of the 24 solar Terms advocates adaption to nature and harmonious coexistence, which matches to the idea of environmental protection and sustainable development nowadays. It satisfies the cultural imagination of overseas audiences by means of multi-modal metaphor and metonymy.

5.2. Behavior Level

The metaphor of the material level builds the cultural significance of the 24 solar terms. Compared with the former one, the behavioral level makes a further step, such as the art performance, handicraft production, folk knowledge and food production related to the 24 solar terms. Combined with the survey results of the above analysis, most students are fond of food and folk culture. From the perspective of cross-cultural communication, food is the first and foremost sustenance in people's lives. Chinese cuisine is a delicate and skillful art with great appreciation. In the short video, we could appreciate the process of preparing ingredients, making spring roll skins, mixing fillings, frying and so on. The cooking images (Fig 2) and sound effects in this process are metaphors of DIY culture, which can be traced back to the 1960s. Thanks to Barry Bucknell, a popular British TV show host, it was he who firstly defined and promoted DIY: advocating self-design, self-creation, and minimalism etc. Since the beginning of the 21st century, DIY culture has gained popularity among young people. In the Festive China, the sound of cutting the ingredients and frying spring rolls could be clearly sensed in the short clip. The sound mode expresses the complete production process of spring rolls. The sound effect is a metaphor for "24 Solar Terms is DIY culture".

The cooking video and sound are conducive to creating a common meaning space for overseas audiences, mapping the 24 solar terms culture and real life from the perspective of daily life, and experiencing the traditional Chinese culture personally through immersive experience. According to Edward Hall's (1943) theory of high-low context culture, it is tough for audiences in low-context countries to interpret the

symbols and information coding of cultures in high-context countries. Therefore, reducing the use of language and translation contributes to trigger the same cultural schemata, making the spread of the 24 solar terms culture smoother.



Fig 2. The Cooking Image of Spring Rolls

5.3. Spiritual Level

The spiritual level of the 24 solar terms belongs to the deepest level, it not only contains the concept of harmonious coexistence between man and nature, but also the worship and the aesthetic understanding of the world. Next, adapting to the climate is the cultural spirit of the 24 solar terms, which is also the basic code of conduct of ancient Chinese. The formation of the conduct has a profound ideological basis. First of all, the ancient Chinese people formed the cognition of the laws of nature in the long-term social practice. The alternating seasons of the year is originally a geographical phenomenon. But people found that the movement of time has a regularity. Therefore, the connection between time and agricultural production was established. And they deeply realized that only by adapting to the time and respecting the objective law could they get the expected results. In addition, the culture of the 24 solar terms is closely related to the theory that people is an integral part of nature in ancient China. On the other hand, the subjective initiative of human was weighted. It was not only involved with the adaptation to nature and respect for nature, but also the rational use of nature was included. It's not only a matter of Heaven-sent occasions but also a matter of human endeavour. For instance, the video introduces the spring solar terms: the Beginning of Spring, Rain Water, Insect Awakening and so on. The images of mountains, water, trees and flowers occupy the whole picture. With the assistance of Huizhou architecture, a representative product of Chinese architectural culture and the terraces reflect the spatial dimension of nature. Color modality also mapped the dimensions of time. The use of pink lotus in summer is also a metaphor for the prosperity of all events; In autumn, the video shows orange maple leaves and depicts the scene of children flying kites, implying that crops are ripe and it was the harvest time. Through the colors and images of natural scenery, the paper constructs a natural metonymy of time and space of the 24 solar terms by using part to refer to the whole. The background music is played with eastern instruments, which is relaxing, lively, and melodious, reflecting the serenity and harmony pursued by ancient Chinese people, and is a metaphor for the harmonious coexistence between human and nature. The proper use of multimodality means stimulating the positive emotions shared by all human beings. Therefore, in the process of cross-cultural communication, emotion, as the most primitive instinct of human beings, has an instinctive and rapid response compared with other information mechanisms. For example, family love and friendship are the common emotions. Empathy plays a crucial role in effective communication between individuals from different cultural backgrounds, which is conducive to the rapid decoding of information by the audience, so as to realize the recognition of overseas audiences to the spiritual world of Chinese culture.



Fig 3. The Image of Terraces

6. Conclusion and Inspiration

The 24 Solar Terms is endowed with deep meaning in material, behavioral and spiritual level that reflect the broad and profound Chinese culture. Saying China Festival makes full use of various modalities such as image, color and sound to realize metaphor and metonymy at three levels. The 24 Solar Terms are shared by the domestic and international people, and has been endowed with a new connotation. The success of the short clips also provides inspiration for the further dissemination of Chinese culture and the national strategy of telling Chinese stories well.

First of all, it is high time that we ought to fully excavate the cultural connotation on the basis of absorbing the traditional culture, and find the similar or overlapping parts in the cultural schemata to arouse the resonance and empathy of audiences with different cultural backgrounds. The study of multimodal discourse fully proves the feasibility of presenting the culture of the 24 Solar Terms in multiple dimensions. Saying China Festival not only introduces the relationship between it and the social practice of the ancient Chinese people, but also refers to the modern elements like DIY, environmental protection and sustainable development. According to the theory of thinking space, overseas audiences have a natural recognition of similar and closely connected cultures. Therefore, it is necessary to form a deeper and broader cultural system in the external communication of the 24 Solar Terms culture so as to form a positive cross-cultural cognition and reduce the obstacles caused by cultural differences.

Secondly, in terms of communication means, multimodality actively produces a marked effect. According to the audiences' cognition and psychology, non-verbal modes are more frequently adopted. Through the interaction of various modes, more intuitive and vivid forms of expression are presented, thus realizing the construction of rich metaphors and metonymy. Language and translation often become invisible barriers in cross-cultural communication. In short videos, concise language and multi-sensory information presentation are conducive to information decoding. Therefore, non-verbal elements are used in cross-cultural communication to form a bridge between high and low context cultures.

Thirdly, we should start from the practical perspective and

use emotional mechanism to establish diversified cross-cultural communication relations. Traditional communication methods tend to express the full landscape of one culture from a macro perspective, showing a top-down passive acceptance, while the multimodality creates individual narrative perspective, which is easier to arise foreign audiences' cultural empathy, thus creating common cultural recognition and emotional space.

Today with the innovation and development of new media, the cross-cultural communication practice of the 24 Solar Terms in China is also constantly innovating, inspiring the scholars to constantly break through the barriers of communication with overseas audiences. To explore Chinese culture's strong vitality and create a global shared space of traditional Chinese culture, we believe that here will be more successful and popular works accepted by audiences at home and abroad in the cross-cultural communication and interaction.

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