Multi-modal Analysis of Textbook Discourse—— Taking the High School English Textbook of PEP (2019 Edition) as an Example

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Abstract: *Multi-modal discourse analysis is one of the hot topics in contemporary linguistic research. Based on systemic functional linguistics, visual grammar, and the complementary theory of conceptual inter symbol, this paper makes case study and statistical analysis of the images in new senior high school English textbooks published by People's Education Press, explores the multi-modal features of the textbooks and puts forward some suggestions on how to make use of the multi-modal features of the textbooks to promote modern English teaching.*

Keywords: *Teaching Material Analysis; Multi-modal Discourse; Images*

1. Introduction

In the era of networks and multimedia, people receive and transmit a large amount of information through various channels. At the same time, the information and knowledge are shared through multi-modes, such as text, image, sound, and video. In school teaching, textbooks are the carrier and transmission tool of knowledge, and their importance in teaching activities is self-evident. Teaching materials are the primary basis for teachers to design and carry out teaching activities, and they are also the basis for learning—an essential source of knowledge. Nowadays, textbooks are no longer a single text but rich modal resources, such as colors, images, audio, and video. These modal resources are also symbols for transmitting the information. English Curriculum Standards for Compulsory Education (2022 Edition) suggests that "teachers should realize modern information technology not only provides multi-modal English teaching Means, platform and space, but also plays an important supporting role in creating a good learning environment, promoting the renewal of educational ideas and the reform of teaching methods." [1]. Besides the tendency to integrate multi-modal resources in teaching, a textbook is one of the discourses that can best reflect the multi-modal trend in modern society [2]. The textbook contains multi-modal resources such as text, images, audio, and video. Chen Yumin and Wang Hongyang analyzed the multi-modal texts of natural science textbooks. They found that the texts and images of the textbooks complement each other, forming a multi-modal text with coherent semantic cohesion [3]. Lan Yuling analyzed and compared the covers of English textbooks of Grade 1 in 1995 and 2001, and thought that visual symbols and linguistic symbols could express the theme in a complementary way, such as parallelism, prominence, and contrast, to realize the co-construction of meaning [4]. The above research shows that the multi-modal resources in the textbook can cooperate to form multi-modal discourse, and people can realize the co-construction of meaning.

This paper makes a systematic multi-modal discourse analysis of the pictures in the new senior high school English textbooks published by People's Education Press. Based on Systemic Functional Linguistics, Visual Grammar, and the complementary theory of conceptual inter symbol, this paper adopts literature research and text analysis, and makes a multi-modal discourse analysis of the graphic relationship of the required modules of the English textbook for senior high schools (2019), and puts forward some suggestions on how to make use of the multi-modal nature of the textbook to promote modern teaching.

2. Theoretical Basis

2.1. Systemic Functional Linguistics

Literature shows that systemic functional linguistics is the theoretical framework that fits multi-modal discourse best, and the representative figure is Halliday, the theoretical framework, discusses language from context, meaning, form, culture and media, and is used in multi-modal discourse. Language is absorbed and inherited. Multi-modal discourse is systematic and multi-functional. It advocates that the symbolic system is the source of meaning, and contextual factors are closely related to the interpretation of meaning. Based on systemic functional linguistics, multi-modal discourse becomes more systematic and multi-functional. The idea of three meta-functions (language signs have an Ideational function, interpersonal function, and Textual function) in the Meta-functional Hypothesis is also implemented to build a better bridge for developing multi-modal discourse analysis. Multi-modal discourse analysis is based on systemic functional linguistics to analyze multi-modal discourse's characteristics, functions, and meanings. The theoretical basis of this paper is also based on the theory of systemic functional linguistics, which provides solid academic support for this study.

2.2. Visual Grammar

Based on the concept of social semiotics, Kress and van Leeuwen put forward "visual grammar," which, first, the idea expands and extends the thought of systemic functional linguistics. With the progress of research, Kress and van Leeuwen advocated the idea that image is one of the symbolic resources to realize the three meta-functions of vision. From the perspective of Ideational function, interpersonal function, and Textual function, it corresponds to the three functions of representational meaning, interactive meaning, and compositional meaning. (Table 1)

Table 1: Systemic Functional Linguistics and Visual Grammar.

Systemic Functional Linguistics	Visual Grammar
Ideational Meta-function	Representational Meaning
Interpersonal Meta-function	Interactive Meaning
Textual Meta-function	Compositional Meaning

2.2.1. Representational Meaning

Representational meaning, corresponding to conceptual meta-function, refers to an image's phase between people, places, and things. Interaction and relationship, which includes narrative representational and conceptual representational. Among them, there are three processes of narrative representational: action process, reactional process, and speech & mental process. Compared with narrative representational, conceptual representational constructs abstract concepts. Meaning is a kind of general, broad, stable, eternal, infinite representation of the participation process through Classify, analyzing and characterizing the images, and conducting multi-modal discourse analysis. Therefore, narrative representational and conceptual representation, the most significant difference in representational lies in whether the participants form a carrier in vision. (Figure 1)
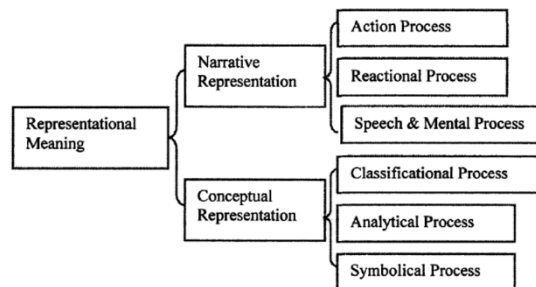

Figure 1: Representational Meanings in Visual Images.

2.2.2. Interactive Meaning

Interaction meaning corresponds to interpersonal meta-function, which means that any symbol pattern must be able to project the symbol producer. And the receiver of the symbol. There are two kinds of participants in the expression of interactive meaning: representational participants and interactive participants. Among them, the representation of participants means people, places, events,

and other factors in the image; Participants indicate the producers, participants, and readers included in the image [5]. Therefore, the interactive relationship expressed by images is described by three key factors: contact, social and attitude. Contact refers to the vector formed by eye contact between interactive participants and represented participants, divided into asking or offering. Social distance reflects the relationship between participants, divided into close distance, medium distance, and long distance. Attitude refers to participants' subjective and objective perspective. (Figure 2)
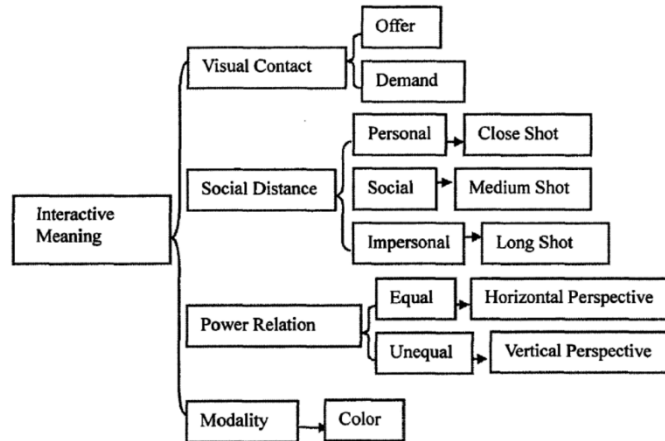

Figure 2: Interactive Meanings in Visual Images.

2.2.3. Composition Meaning

Composition Meaning, one of the three meanings, corresponds to the meta-function of the corresponding Textual meta-function. The overall layout and meaning are realized by information value, Salience, and framing. Specifically, information value, Means different positions of value components: left and right, top and bottom, middle and edge, vertical and horizontal. Salience refers to the fact that elements attract readers' attention from different degrees to get the attention of each component. The framing is connected and divided by the presence or absence of the frame structure in the image to Show the relationship between components. (Figure 3)
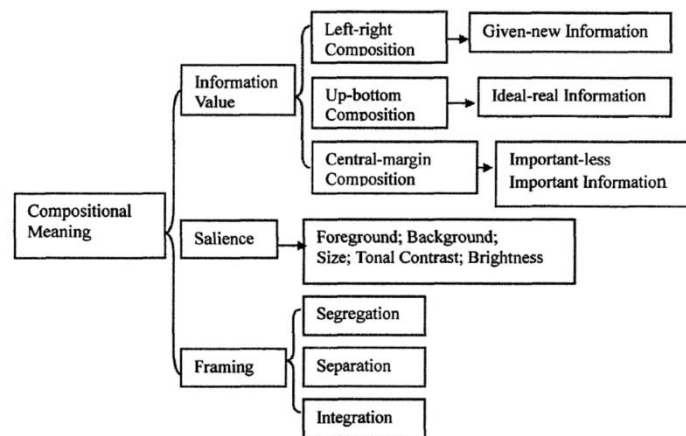

Figure 3: Compositional Meanings in Visual Images.

This study is based on the meaning of representational, interaction, and compositional in visual grammar. It aims to analysis and explore the multi-modal discourse on the relationship between graphics and text in the compulsory module of new senior high school English textbooks, and it is to help textbook users understand the meaning of the pictures in the new old high school English textbook.

2.3. Conceptual Inter-symbol Complementary Theory

With the advancement of research, Royce put forward the theory of Conceptual Inter-symbol Complementary Theory based on the exploration of the essence of the symbolic relationship between image and text, and then put forward a more detailed framework of inter-symbol complementary for multi-modal discourse analysis based on systemic functional linguistics and visual grammar. This framework is based on the idea of social semiotics. Its central core is to elaborate on and explain the

meaning relationship between image and text to explore the complementary relationship. Regarding the analysis of abstract symbols, Royce (2007) proposed visual meaning elements (VMEs): logo, activity, environment, and attributes. VEMs refer to visual features with semantic attributes, which can be realized by various visual technologies [6]. Therefore, based on linguistics, about analyzing cohesive attributes of spoken or written texts, Royce put forward six semantic relations between connecting verbs and verbs in multi-modal texts: repetition, synonym, antonym, hyponym metonymy, and collocation. Correspondingly, in the process of representation, there are complementary relations between graphics and text: Repetition, antonym, near meaning, hyponym, whole and part, and collocation. What needs to be emphasized is that the relationship between symbols enables language and images to be unified in the same theoretical framework rather than being analyzed separately. Therefore, based on the theory of conceptual inter-symbol complementary, when discussing the inter-symbol complementary between pictures and texts, we can first describe the pictures in the text as a whole, then analyze the words that appear together, and finally determine their complementary by combining the analysis of image and text. Based on the theory, this study compares the image and text of compulsory modules in the English textbook for senior high schools (2019). This paper aims to explore the complementary relationship between relations symbols, to clarify how image and text in textbooks complement each other to construct meanings.

In conclusion, based on the theoretical basis of Systemic Functional Linguistics, visual grammar began to attach importance to language. The systematic meaning generation of symbols puts forward the three meanings of images to comprehensively and systematically analyze the textual context. The meaningful construction of the Department provides a framework and reference. With the deepening of the research, Rovce has designed a method to interpret image and text. The inter-symbol complementary framework provides a bridge for concrete multi-modal discourse analysis. Therefore, the system's functional language, visual grammar and the complementary theory of conceptual inter symbol together provide strong support for analyzing the graphic relationship in the textbook.

3. Research Design

3.1. Research Object

The textbook selected in this study is a compulsory module of the Senior High School English Textbook (2019) published by People's Education Edition. Firstly, count the pictures in the textbook, measure the total number of pictures in the compulsory series of textbooks, the distribution of pictures in each part, and the average number of pictures, to contribute to data statistics and analysis and lay the foundation for more detailed analysis. The overall data is shown in Table 2.

Table 2: Overall Statistics of the Number of Pictures of Compulsory Modules in Textbook

The Part of Textbook	B1	B2	B3	Total	Mean
Opening Page	5	5	5	15	5
Listening and Speaking	33	24	12	69	23
Reading and Thinking	9	9	11	29	9.67
Discovering Useful Structures	7	4	4	15	5
Listening and Talking	17	12	22	51	17
Reading for Writing	8	11	10	29	9.67
Assessing Your Progress	11	19	7	37	12.33
Video Time	10	17	5	32	10.66
Total	100	101	76	277	92.33

3.2. Research Methods

The statistical data tool used in this research is Excel. The specific statistical method is to browse the images of the three textbooks one by one, read the chapters where the images are located, and understand the image and text. Then, according to the theory of visual grammar, according to the related concepts, compare them one by one to judge the type of each image. For example, suppose you see a dialogue bubble or thought bubble in a snap. According to the known definition: the speech and psychological processes are usually formed in dialogue bubbles or thought bubbles, and these bubbles connect the participants in the image. In that case, the image belongs to the speech and psychological processes under narrative representational in the sense of repetition.

4. Results and Discussions

This study draws the following conclusions by exploring the 277 pictures of the compulsory module of the PEP Senior High School English Textbook (2019):

4.1. Embodiment of Visual Grammar

Based on the theoretical basis, analytical dimensions, and data statistics, the pictures of the required modules in the new textbook conform to the visual grammar. Theory fully embodies the three meanings. This study makes a detailed and systematic analysis and inquiry on this issue, which can promote it. Understanding of the characteristics of social symbols in language. Next, from the perspective of three significant meanings, the research is comprehensive and systematic.

First of all, from the perspective of the meaning of representational, the pictures of compulsory modules in the new textbook include both concept representational and narrative representational is included, and the conceptual representational is slightly more than narrative representational. Therefore, a proper amount of meaningful pictures can better represent the content and meaning of textbooks and further promote the construction of language knowledge. Besides, in the teaching process, these pictures can better assist the representational of teaching content, which is conducive to teachers' teaching and students' understanding. They can better prepare for the formation of subject literacy.

Secondly, from the perspective of interactive meaning, the pictures of the compulsory modules in the new textbook are analyzed by contact and social distance. And attitude to construct interactive meaning. From the pictures about the meaning of interaction, in contact, it objectively represents the meaning of pictures to readers. Therefore, the provided pictures are reflected. It is more conducive for viewers to understand the image content objectively and fairly and is not easily interfered with by other factors; among the social distances, close-range pictures rank first, middle-range pictures rank second, and long-range pictures rank last. Therefore, it can be drawn closer. Distance from readers, breaking the sense of isolation, attracting attention, and visually highlighting the meaning and value of pictures; In attitude, the number of positive angles is much higher than that of oblique angles. Therefore, the most significant number of positive angle pictures can help readers express pictures correctly and communicate with readers kindly and equally. In addition, in the teaching process, these pictures can more intuitively and objectively reflect the teaching content, better serve the teaching process, and help construct students' multi-reading ability.

Finally, from the perspective of the meaning of composition, the pictures of compulsory modules in the new textbook are constructed by the overall layout of pictures and presented by information value and frame. From the information value, in the overall layout, the number of pictures in the middle is the largest, followed by the top left, the rest are the top right, the bottom left and the bottom right is tied for the last. Therefore, the picture located in the middle of the overall spatial arrangement can show the meaning of the picture more prominently, convey feelings better, enhance the appeal to readers, and help readers recognize and read together. Among them, the pictures distributed in the upper left of the whole space reflect the known and ideal information and benefit readers' sensory experience. Judging from the significance value, pictures often attract readers' attention through the arrangement of foreground and background and the size of participants' specifications, help participants' representation through visual typesetting, and use the contrast of color and clarity to enhance the attractiveness of pictures. From the frame, in the case of wireless strips, there are primarily lines. The segmentation of sequences can improve the independence and individuality of pictures. It is dedicated to presenting clear pictures for readers, eliminating the interference of other unfavorable factors, and avoiding misunderstanding and misinterpretation.

4.2. Embodiment of the Complementary Relationship between Graphics and Text

Visual symbols are used to identify how these symbol resources express meaning and how to represent information and classics. The conceptual function of the test. The data analysis of the complementary relationship of compulsory module images shows that it fully reflects the idea. The complementary relationship between texts and pictures, mutual coordination and cooperation between images and texts, and more accurate and precise expression of feelings are greatly improved. Improve the efficiency and accuracy of English learning. The complementary relationship between images and texts includes repetition, near-meaning, antonym, hyponym, collocation, and the relationship between whole and part. The distribution results of each connection in the picture statistics of compulsory

modules are as follows:

The number of repeated pictures is the largest, ranking first: the next is the hyponym, the second is the collocation, the near-meaning, the whole, and part, and the last is the antonym. There are the most repeated pictures among the pictures in the compulsory module, but there are no pictures with the antonym. Therefore, the pictures of compulsory modules effectively strengthen the ideal graphic meaning of pictures and texts. There is no opposite picture, which conforms to the cognitive characteristics of students and is very conducive to consolidating and strengthening the meaning construction of readers. Besides, in the teaching process, these pictures can express feelings more accurately and clearly, further improve the quality and efficiency of English classroom teaching, be better used and understood by teachers and learners, and be more conducive to the formation and development of the core literacy of the subject.

5. Conclusions

This study analyzes the complementary relationship between image and text in the Senior High School English Textbook (2019) published by People's Education Edition. The research and discovery show that teachers can exert their autonomy in the use of teaching materials under the requirements of the new curriculum standards. To optimize the use of teaching materials, the following are some inspirations:

First of all, from the perspective of the new curriculum standard, one of the connotations of English core literacy is language ability, because Language ability refers to "expressing and understanding meaning by listening, speaking, reading, reading and writing in social situations. The ability of righteousness, emotional attitude and intention "[1]. Therefore, the newly added language skill of "watching" is closely related to multi-modal discourse and can be cultivated and developed through multi-modal resources in newly compiled textbooks. Therefore, in teaching, teachers should pay attention to the learning and application of multi-modal texts in teaching materials when implementing the core literacy-oriented senior high school English curriculum. Moreover, multi-modal teaching materials must rely on English teachers to cultivate and develop students' "seeing" language skills and multi-reading ability by relying on multi-modal curriculum content.

Secondly, designing multi-modal teaching activities guided by the concept of English learning activities. State of teaching materials for effective teaching. First, in the introduction part of the teaching process, you can give full play to the pictures. Reproduce, composition, and interactive meaning, attract students' attention, and pave the way for follow-up teaching activities; At the beginning of each unit of the compulsory module, the textbook writers provide a large layout, great appeal, and visual impact. In nine "theme maps," teachers can quote the unit theme according to its representational meaning and complementary meaning of pictures and texts. This will pave the way for the follow-up activities and prepare for the implementation of the concept of English learning activities. Second, in the teaching process, we can extensively use the three meanings of pictures and the complementary relationship between pictures and texts and use pictures to analyze the text. Consolidate and deepen: for example, in the listening and speaking section, this textbook has the most significant number of pictures, which is convenient for teachers. A large number of pictures are used to express their feelings, which is helpful for listening prediction and oral expression and is conducive to assisting listening teaching. Learn, give play to the three meanings of pictures and the complementary function of pictures and texts, and cultivate students' listening ability and oral expression ability. In the part of reading, thinking, and writing after reading, we can comprehensively use pictures and text resources for students. Experience the conceptual meaning of pictures and texts so as to help students fully understand the text content and cultivate their reading and writing literacy. And thinking quality. Third, for the activities after teaching, we can make full use of multi-modal resources to provide students with more, for a wide range of living rooms for improvement. For example, this textbook designs a self-examination part and a video viewing part for after-school activities. Points can enhance students' attention and attention to multi-modal and cultivate autonomous learning ability, deep learning ability, and multi-reading ability.

Finally, it is particularly important for teachers to use multi-modal teaching materials correctly and effectively, which determines multi-modal teaching. Teaching materials bring into play practical effects. Therefore, teachers can conduct multi-modal discourse analysis on the resources of textbooks according to the analysis dimension of this study and explore and discover how the pictures in textbooks reflect the three meanings of visual grammar and how there is a clear complementary relationship between pictures and texts. On this basis, further combining with the new curriculum

concept, we can make better use of pictures to combine the three meanings and complementary relationships to design effective teaching activities.

Acknowledgments

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