Analysis on Ideational-Textual Function of Verbal Text and Representational-Compositional Meaning of Visual Image of PSA based on Multimodal Corpora

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Abstract. Verbal text and visual images play a crucial role in public service advertisements, which constitute a multimodal discourse rich in various social semiotic resources. Therefore, it is necessary to concentrate on the functions of verbal text and the meanings conveyed by visual images in public service advertisements. This research utilizes a quantitative research approach, drawing on Halliday's systematic-functional grammar and Kress and Van Leeuwen's visual grammar, to examine the multimodal discourse of 93 public service advertisements. The main emphasis of this study is on analyzing the ideational and textual functions of the verbal text, along with the representational and compositional meanings of the visual images, all within a multimodal corpus. The study finds that the material process and the unmarked theme of verbal text are evident, and the symbol process, the top-down structure and disconnection of visual image are evident in PSA. The multimodal meanings of public service advertisements are achieved by constructing both verbal texts and visual images.

Keywords: Multimodal discourse, verbal text, visual image, public service advertisements

1 Introduction

In recent years, there has been a growing interest in the development and application of multimodal corpora across various domains. Multimodal corpora, which combine different modalities such as text, audio, and visual data, offer a more comprehensive representation of real-world scenarios and have opened up new avenues for research and development.

In the field of language learning, Smith and Brown (2023) reviewed the development and application of a multimodal corpus designed specifically for language learning purposes. Their study highlighted the potential of multimodal corpora to enhance language acquisition by providing learners with a more immersive and contextualized learning experience [1]. Johnson and Wang (2023) developed a multimodal English corpus based on functional software. Their work aimed to create a resource that could facilitate the analysis and understanding of language use in software applications

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[2]. Kim and Lee (2023) introduced a multimodal corpus specifically designed for this domain, enabling researchers to study and model the complex interactions between humans and robots [3]. In the realm of emotion recognition, Patel and Singh (2023) presented a comprehensive multimodal corpus for emotion recognition tasks. Their work addressed the need for robust and diverse datasets to train and evaluate emotion recognition systems [4]. Zhang and Chen (2023) developed a multimodal corpus for medical image analysis, combining medical images with associated text and other modalities [5]. Thompson and Davis (2023) presented a multimodal corpus for social media analysis, capturing the multimodal nature of social media content, which often includes text, images, videos, and other modalities [6].

As these studies demonstrate, the development and application of multimodal corpora have become increasingly important across various domains. These corpora provide researchers and practitioners with valuable resources for addressing complex real-world problems and advancing the state of the art in fields such as natural language processing, computer vision, and human-computer interaction. This study explores that the multimodal meanings of public service advertisements are realized through the construction of verbal texts and visual images based on multimodal corpora.

2 The Statement of the Problem

This study, grounded in Kress and Van Leeuwen's Visual Grammar (VG) and Halliday's Systemic Functional Grammar (SFG), investigates the construction of meaning in PSAs and aims to address the following questions:

Problem 1: What ideational functions of verbal text are evident in PSAs?
Problem 2: What textual functions of verbal text are evident in PSAs?
Problem 3: What representational meanings of visual image are evident in PSAs?
Problem 4: What compositional meanings of visual image are evident in PSAs?

3 Methodology

3.1 Research Design

The current study adopts a quantitative research method in accordance with the research questions. Firstly, it analyzes the frequency and percentage of verbal text in terms of ideational function and textual function, and discusses how verbal text fulfills these functions. Secondly, it analyzes the frequency and percentage of visual images in relation to representational meaning and compositional meaning in VG, and examines how visual images realize these meanings.

3.2 Corpus of the Study

The author collects 93 Pro-environmental PSAs from the World Wildlife Fund to build a corpus for this study. The public service advertisements contain 93 images and 133 sentences. Relevant requirements of the data collection are presented as follows:

Firstly, These samples consist of both verbal text and visual image. Secondly, being easy, the visuals of PSAs collected is easy to understand. PSAs containing abstract images will not be selected.

4 Results and Discussion

4.1 Problem 1: Ideational Function of Verbal Text

The ideational function pertains to how language is used to convey human experiences, both external and internal, through the system of transitivity. Our initial goal is to examine patterns in the ideational function expressed through verbal text by examining data statistics, focusing on the frequency and percentage of the six types of processes. In this study, a total of 93 public service advertisements were selected, comprising 133 sentences in all. The table below presents the statistics for the six processes.

From Table 1, it is evident that our data includes four types of processes, with the behavioral and existential processes not being represented in this study. Out of the 102 sentences examined in public service advertisements, the material and relational processes emerge as the predominant processes in terms of percentage. Specifically, the material process is the most commonly found, accounting for 76.7% of occurrences, while the relational process represents 18% of the total. The mental process is present in 3.8% of the data, and the verbal process is seen in 1.5% of instances. Both the existential and behavioral processes are absent, each making up 0% of the public service advertisements. These findings suggest that the material and relational processes are frequently utilized to effectively convey crucial information or descriptions to viewers. The use of the material process adds dynamism to the language, capturing the audience's attention, while the relational process establishes connections between participants. Incorporating the mental process enables viewers to relate to the message and contemplate related issues through the expression of the sensor's emotions. Additionally, other processes like the verbal and relational processes depict objective realities, enhancing the persuasion and credibility of public service advertisements for the audience.

Table 1. The Frequency and Percentage of Types of Process

Types of process	Frequency	Percentage
Material process	102	76.7%
Relational process	24	18.0%
Mental process	5	3.8%
Verbal process	2	1.5%
Behavioral process	0	0%
Existential process	0	0%
Total	133	100%

4.2 Problem 2: Textual Function of Verbal Text

The textual function of language plays a key role in organizing language into a coherent text, achieved through thematic structure, information structure, and cohesion. This study focuses on analyzing the thematic structure of verbal text, specifically examining whether the theme is marked or unmarked, to investigate how clauses are structured within the overall message.

Both marked and unmarked themes are observed in the verbal discourse of the 103 sentences extracted from public service advertisements. Before delving into a more in-depth analysis of the thematic structure of verbal text in public service advertisements, let's first examine the distribution of different types of thematic structures within the dataset. The table below presents an analysis of the frequency and percentage of various types of themes in the dataset.

Based on the data presented in Table 2, it is apparent that the selected public service advertisements contain a total of 133 clauses. Of these, 111 clauses exhibit an unmarked theme, while 22 clauses display a marked theme. Upon examining the percentage of various theme types in the dataset, it is evident that the unmarked theme is the most commonly employed in public service advertisements, representing 83.5% of occurrences, while the marked theme makes up 16.5% of the total.We observe that some clauses employ the marked theme, which highlights specific characteristics that the producer intends to express, simultaneously grabbing viewers' attention and achieving the purpose of the advertisements. Most clauses, however, utilize the unmarked theme, which rapidly and accurately conveys main and prominent information to viewers. Whether using the marked theme or the unmarked theme in clauses, both can have different effects on viewers. In the context of public service advertisements, how does the verbal text fulfill its textual function? This question will be further investigated within the sampled public service advertisements.

Table 2. The Frequency and Percentage of Types of Theme.

Types of theme	Frequency	Percentage
Unmarked theme	111	83.5%
Marked theme	22	16.5%
Total	133	100%

4.3 Problem 3: Representational Meaning of Visual Image

Representational meaning pertains to visual images that can depict not only the individuals, locations, and objects present in the physical world but also the actions occurring within individuals' inner worlds. According to Kress and Van Leeuwen, representational meaning encompasses both conceptual representation and narrative representation. In the selected samples of public service advertisements (PSAs), there are few instances of conceptual representations, while most of them are narrative representations. The author outlines key characteristics present in 93 images and demonstrates how visual images construct meaning in public service announcements (PSAs).

Table 3. The Distribution of Factors in the Representational Meaning.

Frequency	Percentage		
Narrative	Action process	23	24.7%
	Reactional process	24	25.8%
	Speech and mental process	2	2.2%
	Classificational process	2	2.2%
conceptual	Analytic process	10	10.7%
	Symbolic process	32	34.4%

From Table 3, we can observe that the factors in representational meaning occupy different percentages. Representational meaning is consists of six processes. In the PSAs, the 93 images involve six processes: the action process, speech, and mental process, the reactional process, symbolic process, analytic process, and classificational process. The symbol process is with the highest frequency, accounting for 34.4%. The reactional process accounting for 25.8% is in the second place. The speech and mental process and classificational process are with the lowest frequency, accounting for 2.2%. It can be seen that these six processes are all the process of constructing the advertising meaning. In other words, these six processes are often used in PSAs. However, it should be pointed out that the speech and mental process is rarely reflected in the PSAs. In the discourse of public service advertisement, the meaning of advertisement is often constructed through the interaction between language and image. So the producers use rarely the speech and mental process to carry out the meaning in PSAs.

4.4 Problem 4: Compositional Meaning of Visual Image

This part focuses on how interactive meaning can be combined with representational meaning to form a meaningful whole--compositional meaning. The overall impression of the image can be formed in the viewer's mind through composition. The meaning of composition is achieved through three interconnected principles: information value, salience, and framing.

Information Value.

The distribution of the elements in the picture realizes the information value. The role of a particular element in an image depends on its position, whether it is placed on the top or at the bottom, in the middle or at the edge, the left or right. Elements placed on the left have a different information value than elements placed on the right. The same applies to the top-bottom information value. If the elements are located on the left and right, the elements on the left are “given” and the right is “new”. If some elements are placed above and others below, the elements above are “ideal” and those below are “real”.

Table 4. Distribution of information value.

	Frequency	Percentage (%)
Top and down	50	53.7
Left and right	17	18.3
Center and margin	26	28.0
Total	93	100

From table 4, the analyzed data shows that the information value is realized by the top and down structure (53.7%), the center and margin structure (28%), and the left and right structure (18.3%). The top and down structure account for the largest proportion. The information placed at the top is ideal, expressing a possibility and an idealized effect. The information positioned at the bottom is realistic. It conveys a piece of more realistic and factual information. The center and margin structure take up second place. The central elements are the most important message that the image-maker wants the viewers to pay special attention to. And the elements that serve as margin convey secondary information, which is less important relative to the center. While The left and right structures account for the smallest proportion. In the left and right structure, the addresser may sometimes place new information before old information to emphasize a certain component or for other purposes. After an exhaustive analysis of pro-environmental PSAs, the author finds that the producers typically place the given message on the left (beginning) of the pro-environmental PSAs and position the new message on the right.

Framing.

The last dimension of compositional meaning is framing. In the visual composition, the disconnection and connection of the elements are shown with various other semiotics potentials to serve the purpose of the image producer. Using the frame, the producers can either separate elements or connect them together in the image. The producers indicate a sense of belonging and involvement by the connection of elements and show a sense of independence and separation by the disconnection of elements.

Table 5. Distribution of Framing.

	Frequency	Percentage (%)
Disconnection	50	53.7
Connection	17	18.3
Mixture	26	28
Total	93	100

According to the statistics presented in Table 5, disconnection is the most frequent, accounting for 53.7% of the total occurrences. Following disconnection, connection ranks second with a percentage of 18.3%. For disconnection, there are obvious lines and spaces to separate the images and texts in the PSAs to reflect the clarity of the layout. Except that some images and texts are mixed, it is rare to take pictures as the background or text in the picture. The dominant way of matching images and texts is

disconnection. It is to make pictures and texts independent and easy to distinguish, highlighting the individuality of both.

5 Conclusion

Upon analyzing the verbal text of the chosen public service advertisements, it is observed that the ideational function is predominantly achieved through the material process and relational process, delivering precise information to the audience. Concerning the textual function, the producers typically employ the unmarked theme to swiftly and accurately convey the primary and notable information of the advertisements to viewers. Most advertisements belong to the symbol process, which conveys social responsibility and moral values to the public. The information value is realized through the top-down structure, where the information placed at the top is ideal. It expresses a possibility and an idealized effect. the information at the bottom is real. It conveys a piece of more realistic and factual information. The dominant way of matching images and texts is disconnection. It is to make pictures and texts independent and easily distinguishable, emphasizing the individuality of both. The verbal and visual components collaborate to construct a cohesive and impactful multimodal discourse.

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