

Multimodal Climate Economy Discourse: A Case Study of the Publicity Film of “the National Low Carbon Day” in 2021*

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In the era of the new media, the construction of multimodal climate economy discourse has become an effective tool to address climate change, a crucial issue of human society, which is vital to the present and future of human society and thus has been gaining widespread global attention. This study uses visual grammar as the theoretical framework to examine the multimodal discourse of the 2021 National Low Carbon Day publicity film. By using the analysis tools ELAN and Nvivo12, it claims that this promotional film constructs interpersonal, ideational, and textual meaning by utilizing various visual symbolic resources, such as color, perspective, and character manifestation. This study also discovers that the criteria for using cool and warm colors in this promotional film diverge from the earlier conclusions of the new visual grammar. As a result, it is suggested that color analysis should be conducted in conjunction with the actual corpus in the theoretical framework of the new visual grammar.

Keywords: new visual grammar, multimodal discourse, climate economy discourse, metrological

Research Background

With the development of the economy and society, climate change, driven by the vast emission of greenhouse gases, has become a significant issue of worldwide concern. Bill Gates' *How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need* is a typical example of human observations on globally growing concerns of deteriorating climate conditions. This book, which examines the subject of energy conservation and emission reduction in various disciplines by using economic thoughts, is a valuable resource for anyone who considers the impacts of the climate economy.

With the development of the multimedia era, single-modal texts can no longer meet the needs of public communication, and multimodal discourse, such as graphic posters and publicity films, is gradually becoming the mainstream. China put forward the goal of reaching a “carbon peak” and “carbon neutral” by 2020. Under this background, the theme of National Low Carbon Day 2021 is “Low Carbon Life, Green Future”, which can encourage the public to join in the efforts of energy-saving and emission reduction to achieve the “double carbon” goal.

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This study examines the multimodal discourse of this film and explores its way of meaning construction in order to enrich the findings of multimodal discourse analysis and provide references for the construction of multimodal climate economy discourse.

Literature Review

According to Kress (2010, p. 79), “mode is a socially shaped and culturally given semiotic resource for making meaning” so a complete system that enables meaning such as language, sound, image, etc. is a mode. Communication is often carried out through several modes at the same time, combining visual, audio, verbal and other types of information, and thus forming multimodal discourse (Kress & van Leeuwen, 2006).

On February 24, 2022, we conducted a literature survey with the term “multimodal discourse analysis” on CNKI and retrieved 1,130 journal articles, 681 MA or Ph.D. theses, and 16 conference papers. The annual trend of publications is shown in Figure 1.

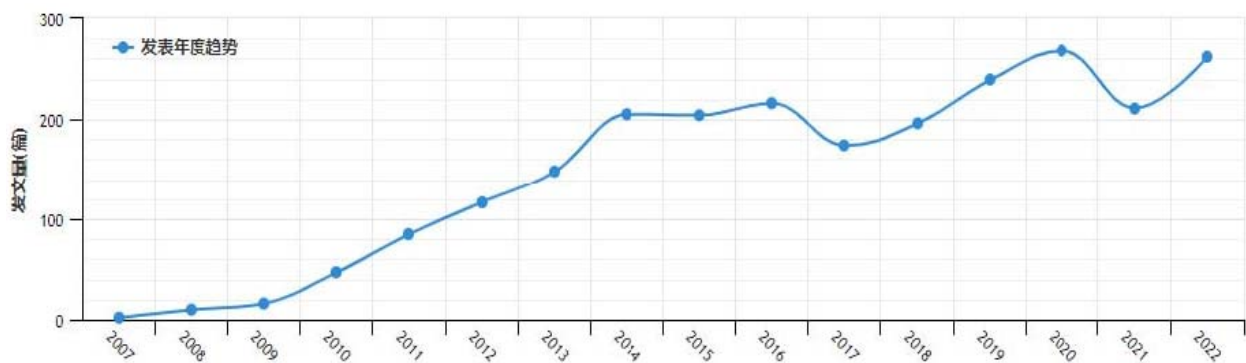


Figure 1. The annual number of papers on CNKI with “multimodal discourse analysis” in titles.

As shown in Figure 1, the number of multimodal discourse studies has been steadily increasing since 2007, with the annual number of publications surpassing 200 in 2014 and remaining over 200 for the next two years. The number of annual publications decreased in 2017 but then progressively grew again and got to a peak in 2020. The number of multimodal discourse studies somewhat decreased in 2021 but still exceeded 200. Until the time we conducted the survey, there were 262 publications published in 2022, which proves that multimodal discourse analysis will continue to receive a lot of attention.

The current empirical studies on multimodal discourse analysis can be generally classified into three types. The first type consists of the multimodal discourse studies based on functional linguistics, which took the visual grammar of Kress and van Leeuwen as the theoretical framework. Zheng and Zhang (2015), for example, chose 44 *The Economist* covers with China themes and examined their visual image meanings. Dong and Wang (2020) studied four types of photographs in *People's Daily* coverage of terrorist acts. Wang (2021) investigated the visual representation of news images in the “anti-epidemic” battle.

The second type comprises cognitive linguistic studies, mostly drawing on Lakoff and Johnson’s conceptual metaphor theory to analyze multimodal discourse. For example, Feng and Xing (2011) used car advertisements to explain the construction of spatial relations and multimodal meaning, pointing out that the association between them is based on metaphorical mapping, thus providing a cognitive account of spatial relations’ information value. Xie and Kuang (2021) investigated the multimodal metaphorical representation and meaning construction in the “New Corona Virus” news cartoon, using the conceptual blending theory.

The third type of study involves a multimodal cognitive-critical perspective. For example, Pan and Zheng (2017) compared the ideological differences in Chinese and American conscription films based on the analysis of multimodal metaphors and metonyms. In addition, military news reports (Pan, 2019), war films (Pan, 2020), and city image promoting films (Wen, 2021) have also become research objects of multimodal cognitive-critical analysis.

Since Kress and van Leeuwen's traditional visual grammar (Kress & van Leeuwen, 1996), Painter, Martin, and Unsworth published *Reading Visual Narratives: Image Analysis of Children's Picture Books* in 2013, which extended the traditional visual grammar. It creates a more comprehensive framework for the analysis of a visual image and incorporates more complex visual discourse, for example, videos. However, few studies in China have employed the new visual grammar as a theoretical guide to analyzing complex visual discourse. One of the difficulties might be the complexity of processing dynamic video corpora. Furthermore, as our literature review above showed, previous multimodal discourse studies focused on political cartoons, urban promoting videos, business websites, commercials, etc. However, the climate economy has received very little attention. Considering the research gap, we use visual grammar of Painter et al. (2013) as a theoretical framework to undertake a multimodal discourse analysis of the 2021 National Low Carbon Day publicity film as a reference for the building of a multimodal climate economy discourse.

Theoretical Framework

Kress and van Leeuwen (1996) proposed three kinds of meaning for images, namely, representational meaning, interactive meaning, and compositional meaning, based on Halliday's three metafunctions. They build a framework for visual analysis of images and establish the disciplinary status of multimodal discourse analysis (Feng, 2015, p. 23). Traditional visual grammar focuses on the single image and ignores the interaction between images and viewers as well as the interplay between texts and pictures (Shi, 2022). To overcome the deficiency, Painter et al. (2013) improved the traditional visual grammar.

The new visual grammar is centered on interpersonal meaning, ideational meaning, and textual meaning (see Figure 2). The interpersonal meaning is constructed by focalization system, pathos system and ambience system. Focalization system deals with both the interaction of the image with its viewers and the viewing perspective that the image provides to its viewers. For pathos system, Painter et al. (2013) considered image representations such as realistic and abstract as discursive strategies to construct the affective relationship between the image and its viewers, and classify image representations into engaging and alienation. Ambience system aims to analyze color resources, which is divided into two states, activated state and denied state, depending on the use of color. Images with black and white colors belong to the activated state, while images using other colors belong to the denied state.

The construction of ideational meaning consists of participants, process, and circumstance. For participants, there are two types of character representation: complete representation and metonymic representation. The difference lies in the fact that the complete representation portrays the facial features of the characters, while the metonymic representation does not fully show the facial features of the characters, but metonymically refers to the identity of the characters through a particular feature. Process examines the relationship between different images in multimodal discourse and provides a theoretical basis for investigating complex multimodal discourse. Circumstance involves the context between adjacent images, reflecting how the context of adjacent image events changes over time.

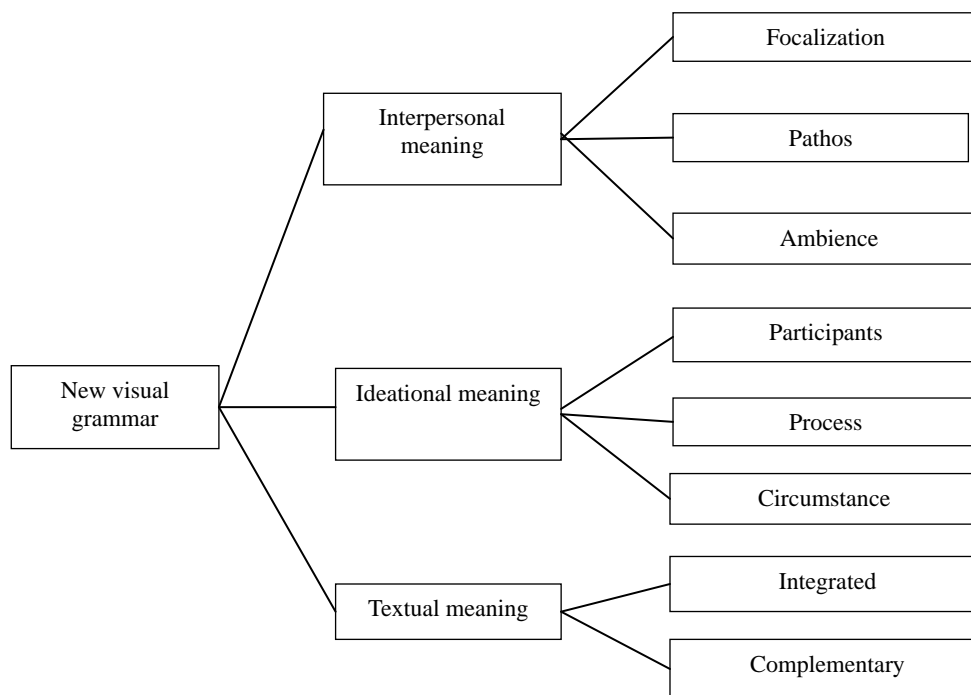


Figure 2. Illustration of the new visual grammar (based on Painter et al., 2013).

Textual meaning provides a theoretical basis for exploring the interactive meaning between language and image. Textual meaning of the new visual grammar refers to the interaction between visual and verbal components realized through a layout. There are two types of layouts: integrated and complementary. In the integrated layout, the text overlays the image, and the two are a whole. The text often explains or supplements the content of the image, and the text has a close semantic connection with the image. In a complementary graphic layout, text, and image each occupies a specific space. When they are closely connected, they have a semantic connection; when separated, they usually do not have a semantic relationship.

As previously discussed, the new visual grammar makes up for the limitations of traditional visual grammar by providing a more scientific and comprehensive theoretical framework for investigating multimodal discourse.

Research Method and Research Questions

This study investigates how the climate economy discourse can ensure authority and efficiency in public communication. The study uses the publicity film for the 2021 National Low Carbon Day released by the Ministry of Ecology and Environment of the People's Republic of China as research material. The film is 2 minutes and 58 seconds long and can be divided into three parts, each of which explores the relationship between climate change and economic development at different levels: from 0 to 56 seconds, the first part covers the climate economy and human development; from 57 to 100 seconds, the second part discusses the climate economy and China's initiatives; from 101 to 178 seconds, the third part explores the climate economy and individual low-carbon living.

This study uses Iedema's (2001) three components of dynamic discourse, namely scene, shot, and frame, to process the video. A scene is made up of more than one shot. A shot consists of many frames, and a frame is "the smallest or representative still of a shot" (Iedema, 2001). To transform the constantly changing video

images into a series of continuous still images, we short-cut the publicity film with the help of ELAN, and the most representative frame in each shot was extracted as the object of the study. In this publicity film, a total of 104 frames of still pictures were recognized, as shown in Table 1.

Table 1

Information About Parts, Duration and Frame in the Target Film

Parts of video	Duration/sec	Numbers of frame
1st part	56	42
2nd part	44	22
3rd part	78	40
Total	178	104

In this study, the retrieved images were encoded with Nvivo12. On the one hand, qualitative analysis can be made. On the other hand, the statistics calculated by Nvivo enable quantitative research. Using multimodal linguistic approaches in this study helps us understand the roles of visual symbols in constructing the meaning of a film and the composition of climate economy discourse on a quantitative level (Liu & Huang, 2012).

The richness and quantity of visual symbolic resources have a significant impact on the representation of meaning. Based on these observations, this study seeks to look into how multimodal climate economy discourse is produced and whether the effectiveness of the discourse is achieved. Particularly, the study focuses on three questions:

- (1) What visual symbolic resources does the publicity film of the “National Low Carbon Day campaign” in 2021 employ?
- (2) How is the meaning of multimodal discourse developed in the publicity film?
- (3) How does the multimodal meaning work out in the publicity film?

Data and Discussion

General Findings

Nvivo12 was used to create the first-level coding nodes of interpersonal meaning, ideational meaning, and textual meaning, as well as the second-level, third-level, and fourth-level coding nodes under each first-level coding node. Totally there are 58 coding nodes at all levels. For each part of the video, the more the coding nodes, the richer the visual resources; the more the references, the more the visual resources. Table 2 shows that the second part has the fewest visual resources among the three parts, while the third has the most, although the difference is not significant. However, the quantity of visual discourse symbol resources employed in the second part is much lower than that in the first and third parts, with the third part having the most. This demonstrates that the video draws on a wealth of visual symbolic resources to create multimodal meanings at the global, national, and personal levels. Furthermore, it depicts the relationship between individual conduct and the climate economy with more visual symbolic resources, congruent with the promotional video’s public-oriented and call-to-action positioning.

Construction of Interpersonal Meaning

The study of interpersonal meaning reveals the interaction between viewers and images, which in this case is the interaction between the viewers and the publicity film. According to our statistics, all three parts of the

film used a large number of visual symbols to construct interpersonal meaning. The number of interpersonal meaning references accounts for 73% of the total, which is significantly higher than the number of references coded for textual meaning and ideational meaning (see Figure 3). The film’s central theme is the formation of interpersonal meaning, as the statistics have shown.

Table 2
Information About Codes and References in the Target Film

Parts of video	Number of codes	Number of references	Percentage
1st part	25	825	39.4%
2nd part	23	360	17.2%
3rd part	27	910	43.4%

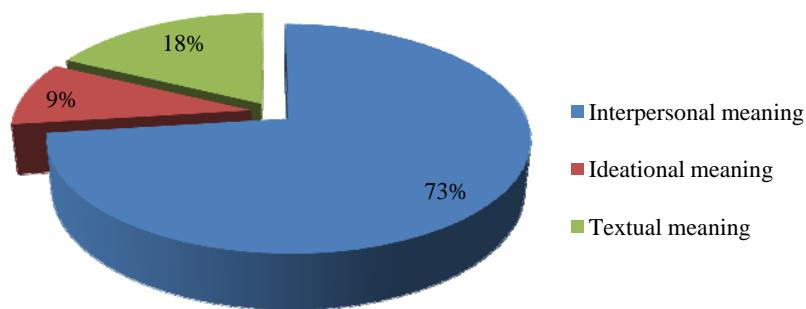


Figure 3. The statistics of references coded for meanings.

Focalization system. Figure 4 depicts the focalization system of the new visual grammar, which consists of interaction and perspective. Contact is established through eye contact (Feng, 2015, p. 24). Table 3 shows the statistics for the interaction and perspective frames in the film for the 2021 National Low Carbon Day campaign. In terms of interaction, the characters and the viewers in the film do not make much eye contact, and the viewers are mostly spectators, with contact occurring only in the third part; the part discusses the relationship between individual actions and the climate economy. The characters’ eye contact with the video viewer develops a bond between them which can not only draw the viewers closer to the theme of the film but also elicit emotional resonance, in the form of agreement, support, and empathy, in the viewer. Consequently, adding human contact to this part can help improve the publicity film’s appealing power and produce better publicity.

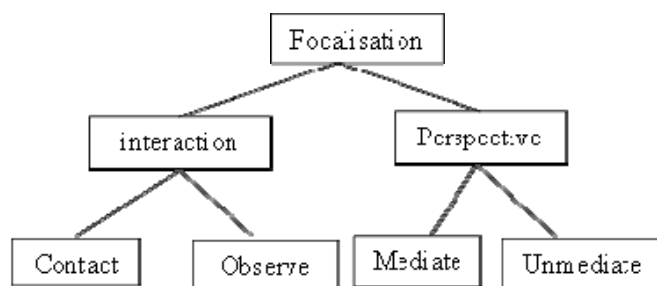


Figure 4. Focalization system (based on Painter et al., 2013).

Table 3

The Statistics About the Construction of Focalization System

Nodes		Numbers of reference	Percentage
Interaction	Contact	9	26.5%
	Observe	25	73.5%
Perspective	Mediated	16	15.5%
	Unmediated	87	84.5%

As shown in Figure 5, the worker in the image is smiling and expressing positive emotions. The eye contact between the worker and the viewers narrows the gap between them, allowing the worker's emotions to better influence the viewers to convey the positive meaning of a low-carbon lifestyle, which will bring happiness.



Figure 5. The image of a worker in the publicity film for the 2021 National Low Carbon Day.

In terms of perspective, the 2021 National Low Carbon Day film offers viewers an unmediated viewpoint, in line with the official video's goal of providing objective and realistic information. However, in the third part, the video takes a more mediated approach to constructing the meaning of the relationship between individual energy-saving and emission-reducing behaviors and the climate economy. It aims to integrate viewers into the characters in the video by making them feel as if they are in the scene, thus better persuading them to act. As depicted in Figure 6, the image uses the subjective perspective of the person, filming the chopsticks washing scene so that the viewers are placed in the situation and then feel like the person in the video.



Figure 6. The image in the publicity film for the 2021 National Low Carbon Day.

Pathos system. There are two representations of the pathos system: engaging and alienation (see Figure 7). In the representation of engaging, the image’s creator attempts to establish an emotional bond between the image and its viewers, whereas in the representation of alienation, the image is mostly abstract, and the viewers’ emotional involvement in the image is minimal. The representation of engaging is further divided into appreciation, empathy, and personalization based on the degree of emotional involvement, with the abstract degree of image representation decreasing and the realistic degree increasing in the order of the three, resulting in the most natural style and vivid image in the personalization.

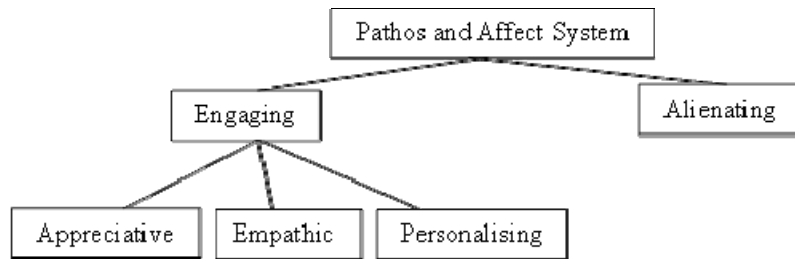


Figure 7. Pathos and affect system (based on Painter et al., 2013).

According to image recognition and coding (see Table 4), this publicity film uses personalizing images. Personalizing images are realistic and close to the natural style, creating a natural and colorful style. Figure 8 depicts a family gathering scene on a green lawn, and Figure 9 displays an adult and a child throwing garbage into a garbage can. Simultaneously, the usage of personalizing pictures can effectively enhance the viewer’s emotional engagement and the film’s appealing effects.

Table 4

The Statistics of the Construction of the Pathos and Affect System

Nodes		Numbers of references	Percentage
Engaging	Appreciative	0	0
	Empathic	0	0
	Personalizing	104	100%
Alienation		0	0



Figure 8 and Figure 9. The images in the publicity film for the 2021 National Low Carbon Day.

Ambience system. Ambience refers to the emotional tone constructed by color in a visual narrative (Painter et al., 2013, p. 35; Feng, 2015, p. 24). According to the theoretical framework of the ambience system (see Figure 10), the film for the 2021 National Low Carbon Day uses many colors, so the atmosphere system of

all images is active, and the activated ambience system enhances the realism of the images and the proximity of the viewers to the images. In terms of colors, the statistical results suggest that the film is primarily bright, but 13.5% of the images are depicted in gray color, as seen in Table 5. The first half of the film, which deals with global economic development and climatic change, is dominated by gray color pictures. The photographs in this part depict environmental issues arising from climate change, such as vegetation degradation and excessive precipitation. The gray color evokes a gloomy and depressing emotional response, highlighting the terrible consequences of climate change. The beautiful natural landscape, rich metropolitan sceneries, rapid industrial development, and residents' low-carbon lifestyles are all portrayed in bright hues. Bright colors not only generate a pleasant atmosphere but also emphasize the positive significance of economic growth driven by industrial development. By shifting the color scale, the film underlines the climatic crisis while simultaneously reinforcing the economic growth gains brought about by industrialization.

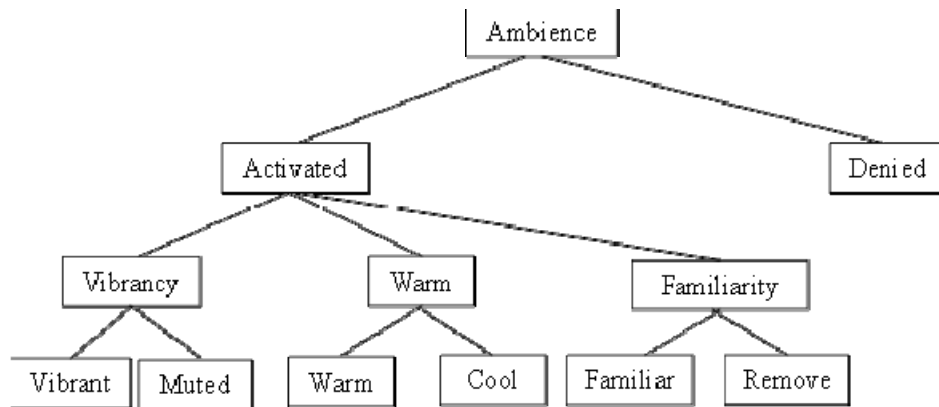


Figure 10. Ambience system (based on Painter et al., 2013).

Table 5
The Statistics About the Construction of the Ambience System

Nodes			Numbers of references	Percentage
Activated	Vibrancy	Muted	14	13.5%
		Vibrant	90	86.5%
	Warmth	Warm	8	22.2%
		Cool	28	77.8%
	Familiarity	Removed	0	0
		Familiar	104	100.0%
Denied	0		0	

In terms of warmth, however, the use of cool and warm colors in the publicity film differs from the conclusions in the previous studies conducted under the framework of the new visual grammar. The film uses a lot of cool colors, like a blue sky, green trees, and green hills to emphasize the subject of “Low Carbon Life, Green Future”, as demonstrated in Figures 11, 12, and 13. The cool colors are used to emphasize the symbolic meaning of “green, low-carbon, and environmental protection” rather than to produce a cold and distant atmosphere. As a result of our research, we believe that color resource analysis should be integrated with the communicative aims of research materials, with a focus on the symbolic significance of colors as well as their common qualities.

In terms of familiarity, the images in this promotional video are all natural in style, with a high degree of colorfulness, showing the authentic appearance of things, thus creating an emotional atmosphere between the viewers and the visual images, which is in accordance with the promotional video's goal of increasing emotional affinity and public participation.



Figure 11, Figure 12 and Figure 13. The images in the publicity film for the 2021 National Low Carbon Day.

Construction of Ideational Meaning

Traditional visual grammar focuses on constructing visual processes in the construction of conceptual meaning (Feng, 2015, p. 25), whereas new visual grammar focuses on participants, process, and circumstance. The promotional film for the 2021 National Low Carbon Day concentrates on the third part of the character characterization. Both complete and metonymic representations are used, as shown in Table 6. The difference is that the complete depiction primarily depicts the characters' facial expressions, with the goal of emphasizing their emotions and eliciting an emotional resonance in the viewers. The metonymic representations, on the other hand, primarily illustrate the characters' behaviors, with the goal of highlighting their energy-saving and emission-reducing practices and encouraging the viewers to join in. Figure 5 shows the worker's entire facial expressions in the photograph, displaying his happiness and having a deeper impact on the viewers. Figure 6, on the other hand, emphasizes the character's hands, directing the viewers' attention to the character's energy-saving and emission-reduction practices and encouraging the viewers to join in.

Table 6

The Statistics of the Construction of Ideational Meaning

Nodes		Numbers of references	Percentage
Participants	Complete representation	18	47.4%
	Metonymic representation	20	52.6%
Contextual relations	Maintain context	89	85.6%
	Changing context	15	14.4%

In terms of relationships between events, since the images in this study are from cut sequences, one still image is selected as an example in each shot, so multiple images can construct the same event. The key events in this publicity video are industrialization, climate change, and a low-carbon lifestyle. Among these, there is a sequential event relationship between industrialization and climate change and a sequential event relationship between climate change and low-carbon living. In the first relationship, climate change is the effect, whereas, in the second relationship, it is the cause.

In terms of contextual relationships, there are numerous changes in context between camera switches in this publicity film. Yet, there are still images of the same event by shifting the perspective, giving multiple

shots of the same event to enrich the same event context. The shift of context is a key aspect of this film, which allows the restricted time in the film to contain more event contexts in order to transmit more information.

Construction of Textual Meaning

The textual information of this publicity film is generally delivered in the form of subtitles. Subtitles are placed at the bottom of the images, which shows an integrated relationship between images and texts. The close relationship between texts and images, as well as the interplay of multiple modalities, can be realized by this layout. In addition to the subtitles, the third part of the film includes explanatory texts overlaying the image, providing further context for the images' content. As seen in Figure 14, the subtitles are at the bottom of the image and overlaying the picture, and the text gives data to explain the advantages of the characters' behavior. Such a layout works efficiently in enhancing the building of the images' meaning through the interaction of images and texts.

However, not every frame needs much textual information to establish optimal image-text interaction. In some cases, too much textual information will fail to highlight critical events due to the flashing nature of video images but make it more difficult for viewers to watch, thus resulting in a poor watching experience.



Figure 14. The image in the publicity film for the 2021 National Low Carbon Day.

Conclusions

Based on the 2021 National Low Carbon Day publicity film, this study conducted a multimodal discourse analysis of the climate economy discourse in terms of the construction of interpersonal meaning, ideational meaning, and textual meaning. By using the new visual grammar as a theoretical framework and combining qualitative and quantitative research, the study came to the following conclusions:

First, this publicity film employs visual symbolic resources such as color, perspective, character manifestation, event relation, and image interaction in order to construct multimodal meanings at the global, national, and individual levels, with a focus on multimodal discourse meaning at the individual level. There are 910 visual symbolic references of coding in the construction of multimodal meaning at the individual level, accounting for 43.4% of the total number of reference points. The result is in line with the purpose of the publicity film of raising public concerns and calling for public action.

Second, statistical findings demonstrate that references connected to the construction of interpersonal meaning in this film accounted for 73% of the total, indicating that the publicity film concentrates on the construction of interpersonal meaning. 73.5% of the total references in the interactive frame are “observe”,

while 84.5% of the total reference points in the perspective frame are “unmediated”, reflecting the official video’s subjectivity and authenticity. At the same time, the emphasis of the three parts on the construction of interpersonal meaning varies. All viewers are presented with an objective perspective in the part on the global economy and climate change so that they can rationally examine the problems; in the part on the climate economy and China’s action, all viewers adopt an objective perspective, but there is a side-by-side interaction between the image characters and the viewers; and in the part on the climate economy and individual low-carbon action, there is a subjective perspective. The subjective viewpoint, as well as the contact and interaction between the image characters and the viewers greatly reduces the barrier between the images and the viewers, and better elicits the viewers’ emotional resonance.

Again, in terms of the ambience system, cool colors like green and blue are utilized to signify a green and good climate environment, rather than to create a cold and distant emotional atmosphere in the publicity film. As a result, the relationship between the use of cool and warm colors and the emotional milieu differs from previous studies. Based on our observation, we propose that in the study, the analysis of color use should be integrated with the types of target materials and their actual effects on the construction and communication of meaning.

Finally, through the building of multimodal meaning, this film promotes the topic of “Low Carbon Life, Green Future”, displays existing climate change challenges, explains China’s action initiatives, and encourages the people to participate. It demonstrates the film’s nature of popularization, education, and attraction, as well as its good publicity effect as a valuable reference for the building of a multimodal climate economy discourse.

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