

A Cognitive Analysis of Multimodal Metaphors in News Cartoons Based on Conceptual Integration Theory

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Abstract—The meaning construction and interpretation of metaphor exist in verbal and non-verbal forms (multimodal forms such as sound and color). As the carrier of verbal and non-verbal symbols, the function of news cartoons is far greater than that of words. Based on the conceptual integration theory, this paper analyzes the multimodal metaphor phenomenon and meaning construction process of news cartoons with the theme of “uniting as one to fight the epidemic” selected from China News Cartoons Network. The research finds that the multimodal metaphorical representation of “uniting as one to fight the epidemic” reflects people’s basic cognition, which is affected by one’s experience, history and culture; the meaning construction of the multimodal metaphorical scene of “uniting as one to fight the epidemic” has the characteristics of dynamic processing. This paper aims to enhance people’s awareness of novel coronavirus through the cognitive interpretation of multimodal metaphors in news cartoons.

Index Terms—Metaphor, news cartoons, conceptual integration theory, multimodal metaphor, meaning construction

I. RESEARCH BACKGROUND

In the context of the global concern over the outbreak of the New Coronavirus, the value of professional media to “exert social influence in a timely manner” has been highlighted [1]. A call for cartoons on the topic of “Fighting the epidemic with unity” was published on the *China Daily* website on 28 January, 2020, in the hope that cartoons would help the public understand the participation of healthcare workers in the fight against the epidemic, the danger and the impact of the emergence of the epidemic. News cartoons often use rhetorical techniques to convey meaning [2–5]. News cartoons are multimodal discourses in which the message is conveyed in the form of a combination of image and text modes, and the mapping between image and text belongs to two conceptual domains, forming metaphors that are multimodal. This paper takes news cartoons on the theme of “uniting as one to fight the epidemic” as the corpus, firstly, to summarize the phenomenon of multimodal metaphors and understand the cognitive patterns of the readers, and secondly, to analyze the meaning construction of multimodal metaphors in news cartoons by applying the theory of conceptual integration, so as to help the readers better understand the meaning in news cartoons, and also helps to develop their literacy skills in the information age [6].

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II. MULTIMODAL METAPHORS AND CONCEPTUAL INTEGRATION THEORY

A. Multimodal Metaphors

As a cognitive approach, the essence of metaphor is “the use of one thing or phenomenon to understand another experience [7].” The Conceptual Metaphor Theory (CMT) proposed by Lakoff and Johnson is the theoretical basis for the in-depth study of metaphor [8]. However, CMT cannot fully explain the process of constructing concepts and meanings that are specifically expressed in unconventional metaphorical languages [9]. Forceville [10] argues that “multimodality refers to the use of two or more modes to represent a metaphor, where the mapping of the target and source domains is characterised in different modes”. Based on the analysis of various language categories (e.g., advertisements, cartoons, films, etc.), especially cartoons, Forceville *et al.* [11] analyzed the consistency of multimodal metaphors with verbal metaphors in cartoons and summarized the characteristics that distinguish multimodal metaphors from conceptual metaphors, namely dynamism, narrative and vividness.

Domestic research on multimodal metaphors has started late, and studies on them are mainly focused on advertisements and cartoons, e.g., Zhang and Zhan [12] provided a comprehensive and systematic account of the composition and classification of image metaphors in advertisements; Yu [13] and Zhao *et al.* [14] explored the multimodal metaphors in cartoons. With the in-depth study of multimodal metaphors, Musolff [15] found that the metaphorical scenes created by multimodal metaphors in cartoons can give readers more intuitive feelings. In order to fully understand the meaning construction process of multimodal metaphors in news cartoons, Conceptual Integration Theory (CIT), which is characterised by dynamic processing of information, can play a good role in its interpretation.

B. Conceptual Integration Theory

Inspired by conceptual metaphor theory, Fauconnier and Turner [16] relied on Mental Space to propose a theory of conceptual integration. The theory argues that integration is ostensibly a simple operation, but in practice it yields infinite possibilities. The operational system of conceptual integration theory consists of Input Space I, Input Space II, Generic Space and Blend Space, the mapping relationships of which are the conceptual integration process [17]. As two different cognitive domains, Input Space I and Input Space II have a local mapping relationship. The genus space is formed based on the projection of elements common to both input spaces. The synthesis space is generated by the selective

projection of the two input spaces, and then human knowledge is used to carry out a dynamic reasoning, meaningful operation and cognitive extension process on the information in the synthesis space [18], so as to achieve the synthesis of new semantics or structure, i.e., the content in the Emergent Structure.

Domestic scholars have already used conceptual integration theory to explain the dynamic construction of multimodal metaphorical meaning in movies or comics, for example, Wang and Liu [19] explored the role of the movie *Avatar* in metaphor construction and cognitive mechanism by comparing conceptual metaphor theory and conceptual integration theory; Lan and Zuo [20] used conceptual integration theory to interpret the large number of scene metaphors in the “food safety” news cartoon image-text metaphor. It can be seen that conceptual integration theory has powerful interpretative power for constructing the meaning of metaphors. Based on the analysis of the representational imagery of the multimodal metaphor of the news cartoons “Fight against the epidemic”, this paper will interpret the meaning construction process of the metaphorical scenes constituted by each representation in the cartoon in conjunction with the conceptual integration theory.

III. RESEARCH QUESTIONS AND DATA COLLECTION

A. Research Questions

Based on the above corpus, this paper will answer two questions: (1) What kind of cognitive rationale does the representations of multimodal metaphors in news cartoons on the theme of “uniting as one to fight the epidemic” convey to readers? (2) Based on conceptual integration theory, how does the multimodal metaphorical scenes in news cartoon on the theme of “uniting as one to fight the epidemic” construct meaning?

B. Data Collection

This paper selected 230 cartoons (excluding duplicate images) from the first 15 pages of news cartoons under the topic module of the *China Daily* website (<http://www.newscartoon.com.cn>), i.e., from January 2020 to April 2020. Based on Eggertsson and Forceville’s [21] view that “metaphors in which the source and target domains are jointly constructed by two or more modes are multimodal metaphors”, 95 news cartoons involving multimodal metaphors were selected for this paper.

IV. ANALYSIS OF RESULTS

A. Representations of Multimodal Metaphors in News Cartoons

According to the six types of news cartoons metaphor representations sorted out by scholar Yu [13]: the image of source domain-the text of target domain, the image of source domain-the symbol of target domain, the image (person)of source domain-the image of target domain, the image of source domain-the implications of target domain, the implications of source domain-the text of target domain and

the text of source domain-the implications of target domain, this paper will first classify the corpus into target domains and explore their representational imagery to understand readers’ cognitive rationale for cartoon metaphors to convey epidemic-related information. Through the analysis of the selected news cartoon corpus, this paper found that the image of source domain-the text of target domain is the most typical type of cartoon metaphorical representation, with 58 cartoons in total. It can be seen that the text in the cartoon lays the foundation for the reader to make a contextual interpretation of an image, i.e., “the textual text is the finishing touch” [22, 23]. Secondly, the most frequent representation in the cartoon is the image (human) of source domain-the image of target domain, where the target domain often omits the text and presents the features and expressions of people or other creatures in anthropomorphic images, making the abstract target domain easy to understand, with a total of 30 images.

The image of source domain-the symbols of target domain, on the other hand, are found in only seven of the cartoons, and this representation is represented by symbols instead of words, reflecting from a concrete mapping to an abstract mapping. Based on the above three representations, this paper categorises the representational imagery of the 95 multimodal metaphors of news cartoons on the theme of “uniting as one to fight the epidemic” (Table I), and summarizes the four major target domains.

TABLE I: THE FOUR TARGET AND SOURCE DOMAINS OF MULTIMODAL METAPHORS

Target Domain	Source Domain Representational Imagery (Individual Counts)	Number	Total Number
Fighting the Epidemic	Artefacts: shield 8 sword 3 weave 2 grenade 1 hand grenade 1 scissors 2 pliers 1 broom 2	20	47
	Body parts: fist 6 hands 10 arm 1	17	
	Animals: panda 1 mouse 2	3	
	People: firefighter 1 Tug-of-war player 2	3	
	Myths, legends and historical figures: Monkey King 3 Guan Gong 1	7	
Medical Staff	People: fighter 8 arm wrestler 1 ploughman 1 boxer 1	11	18
	Myths, legends and historical figures: angel 2 Heavenly Soldier 1 Zhong Kui 4	7	
Novel Coronavirus	People: Boxer 1	1	24
	Artefact: Hammer 1	1	
	Natural phenomena: fire 2	2	
	Plants and animals: octopus 1 bat 7 fox 1 poisonous flower 1	10	
	Mythological figures: demon and monster 10	10	
Negative Effects	Animal: monkey 1 cattle 3 mouse 1 dog 1	6	6

From Table I, the source domain representational imagery mostly draws on man-made objects (things that humans see

and use in their daily lives), body parts, animals and figures (including mythological and historical figures) as source domains to perceive the concepts related to the “novel coronavirus”. Secondly, the multimodal metaphors in news cartoon focus on the four objectives of “fighting the epidemic”, “health care workers”, “the novel coronavirus” and “negative effects of the novel coronavirus”. Specific examples are as follows

First, the metaphorical representation of Fig. 1 is an image of source domain-symbol of target domain. From the colour mode, the bright colors such as red and yellow show the spirit and vitality of the Chinese people, indicating that they are united in their determination to respond to the epidemic. The straightness of the lines shows the sharpness of the action, suggesting that China took swift measures to prevent the epidemic after the outbreak; the gestures and expressions of the figures show that the health care workers are “holding hands”, signifying unity, and their resolute eyes show that China is confident of winning the war against the epidemic. The “needle injection” represents the unity of the Chinese people in their efforts to fight the epidemic, and the fact that medicine is an effective way to save the epidemic. The readers’ vision is influenced by “cultural factors”, and many cartoon creators choose to use symbols instead of words, i.e., the target domain is represented by statutory symbols, such as the flag of the Great Wall, which refer to China. The national flag and the Great Wall are on top, indicating that the Chinese people are actively fighting the epidemic with the strong support of the state. The whole cartoon graphically reflects the belief and determination of the country and its people to overcome the epidemic.



Fig. 1. All the people are one [24].

The epidemic is an “enemy” force that needs to be defended against, therefore, the “health care workers” are mostly compared to “warriors”. The metaphorical representation type of Fig. 2 is the source domain image-target domain textual type. First, the presentation of the text mode “resolutely win the people’s war on epidemic prevention and control” arouses readers’ visual memory—“people’s war” is a valuable experience left by the history of Chinese revolution. Based on this, readers construct a cognitive system of “war against epidemic” in their minds based on their own understanding of “war”, including elements such as participants, process and result of the war against epidemic. Secondly, the text mode of “we are in the same boat to tide over the difficulties together” indicates that in the face of the severe epidemic situation, the whole country has joined hands to prevent and control the epidemic and set off a climax to fight against the epidemic. From the color mode of the characters’ clothes, we can know

their role types: the blue and green color indicates that the medical personnel are not only the angels who save lives but also the fighters against the epidemic, i.e., the participants in the fight against the epidemic; from the expressions of the characters (resolute gaze) and the action mode (fighting the virus with their hands), it shows that the medical personnel are confident in this war and take practical actions to fight against the epidemic, i.e., the process of fighting against the epidemic. The “military sandbox” at the bottom left of the cartoon illustration, from the color module, the symbol-a syringe with a red flag-symbolizes the anti-epidemic weapon, with which the medical personnel destroy the virus and recover the territory of the yellow and purple modules. The yellow color symbolizes light and harvest, indicating the remarkable success of the fight against the epidemic; the purple color is both threatening and inspiring, indicating that the cities more severely affected by the epidemic are working to fight the epidemic and are expected to regain their former vitality, i.e., the results of the fight against the epidemic. The cartoon shows the sense of national mission and responsibility of health care workers, who are always fighting against the epidemic and deserve our praise and commendation for their selfless dedication.



Fig. 2. Each one is broken [25].

The spread and worsening of the epidemic have caused more or less adverse social and economic impacts, such as price hikes by unscrupulous businesses and rumors of the epidemic spread by netizens during the epidemic. In Fig. 3, the image of the novel coronavirus is presented as a mapping of the real-world life form “human”. In terms of image mode, the “novel coronavirus” is transformed into the “hunter”, the “cow” represents the “stock market”, and the presence of the “recliner” and “cigarette” create a relaxed atmosphere—the hunter enjoying the fruits of his hunt. In terms of color, the “stock market” section on the left is predominantly black, indicating that the world economy has been affected by the epidemic and has lost its former prosperity. In terms of movement and facial expressions, the “bull” is locked up, indicating that the stock market is under threat, while the “hunter” smiles, smokes a cigarette and stretches his legs to show that the global economy has been hit hard by the epidemic. Fig. 3 presents the vulnerability of the global economy in the context of the epidemic to the public, thereby reminding countries around the world to keep looking for new economic growth drivers while the global economy is under downward pressure due to the epidemic, with a view to reducing the negative impact of the epidemic.



Fig. 3. Plunders [26].

Based on the above analysis, it is clear that cartoon creators often use images to present social phenomena and related issues to their readers. The realization of the cognitive information transfer process relies on metaphors, and the analysis of the cognitive meaning of multimodal metaphors in news cartoons is based on a number of factors. Multimodal metaphors of news cartoons on the theme of “Fighting the epidemic” is centred on “fighting the epidemic”, “health care workers”, “new coronavirus” and “negative effects”. These four target domains are presented in a way that reflects the commonality of readers’ perceptions of new things through their own experiences and various images from traditional culture, taking into account multiple factors such as social, cultural and emotional factors.

B. The Meaning Construction of Multimodal Metaphors in News Cartoons

In the metaphorical representations of “fighting the epidemic”, “health care workers”, “novel coronavirus” and “negative effects”, multiple images or textual components interact with each other to construct three different types of cartoons. In one cartoon, there are multiple images or textual components that interact with each other to create three different metaphorical scenarios: “fighting the epidemic”, “eliminating the novel coronavirus” and the “negative effects” of the epidemic. This paper will explore how the multimodal metaphorical scenes of news cartoons on the theme of “fighting the epidemic” are constructed in the input space, integration space and layer creation space based on the theory of conceptual integration, in order to help readers better interpret news cartoons.

Fig. 4 is “Shooting the Wolf”, which basically means that a soldier goes into battle and destroys the enemy to defend his country. These explicit elements and activated components form the source domain space of the “brutal war scene of a confrontational nature”, i.e., the input space I. The scene of the battlefield is created by the shooting actions of the warriors and the objects being shot. The image mode in the cartoon: protective clothing, masks, goggles, etc.; and the text mode “novel coronavirus”, all stimulate the reader’s information about the epidemic and build another scene—that of the health workers fighting the epidemic, in which the elements form the target domain space, i.e., Input Space II. There are partial projections in the two input spaces: the war takes place on the battlefield and the epidemic takes place on Earth, the two opposing sides on the battlefield and the fight between humans and the novel coronavirus in the epidemic, the weapons used during the war and the medical equipment needed to fight the epidemic, etc. Based on this, the elements

of the two input spaces form a mapping relationship: soldiers on war horses map the healthcare workers, shields and bows map the weapons used to fight the epidemic, and the battlefield maps the real world. The battlefield is mapped to the real world. The concepts of the origin domain activate the related concepts of the target domain, and selectively enter the synthesis space under the umbrella of the components of the genus space “both sides of the war, the tools used, and the goals achieved”, resulting in the meaning of “medics actively fighting the epidemic”. In the integration space, multiple relationships are compressed, such as the context of soldiers and the battlefield, the danger shared by the fired object, thus establishing a new connection: soldiers fight against the enemy. People operate cognitively according to this layer of creation logic: soldiers fight against the enemy with a view to achieving the goal of defending their home country, forming a layer of creation space-only by eliminating the virus can the lives of the whole world be secured.



Fig. 4. Shooting the wolf [27].

Fig. 5 constitutes the source domain and the textual mode “spring ploughing and removing pests” constitutes the target domain. The source domain presents a picture of a spring ploughman working in a field, which activates the metaphorical mapping items, forming an input space characterised by the “field” scene I. The image modes: protective clothing, masks, etc. The elements of the two input spaces form a mapping relationship: the spring cultivator maps the health care worker, the pest maps the novel coronavirus, and the insecticide maps the epidemic prevention tool. The pesticides map to the novel coronavirus, and the pesticides map to the anti-epidemic tools. The abstract structure of the two input spaces, reflecting their shared structure, is projected onto the genus space, based on the shared structure of “harmful things need to be removed in time”, while the concepts under the origin domain activate the target domain knowledge associated with the audience, e.g., “cultivator”. The concept of “cultivator” activates attributes such as “labour” and “weeding and pest removal”; “pest” activates attributes such as “kill” and “eradicate”, they selectively enter the synthetic space. Based on the textual modes, the reader uses the image medium to form a layer of creative space that reveals the meaning of the cartoon: the novel coronavirus is dangerous and measures must be taken to prevent the epidemic.



春耕和灭虫
Fig. 5. Spring tillage and pest control [28].

Through the above analysis, it can be seen that with the synergy of the various spaces of conceptual integration theory and the cognitive context of multimodal metaphors, these news cartoons comprehensively and dynamically construct scenarios of the Chinese people's determination to fight the epidemic, the selfless dedication of the medical staff and the danger and threat of the novel coronavirus.

V. CONCLUSION

Based on the conceptual integration theory, this paper analyzes the meaning construction process of multimodal metaphors of news cartoons on the theme of "fighting the epidemic", and draws the following conclusions: (1) The multimodal metaphor is currently focused on four themes: fighting against the epidemic, health care workers, the novel coronavirus and negative effects of the epidemic. (2) As a dynamically integrated cognitive process, conceptual integration theory is a powerful explanation of the meaning construction process of multimodal metaphors. In the meaning construction process, firstly, the appearance of multimodal resources deepens readers' awareness of the epidemic, and secondly, the cartoon creators outline their good vision in the form of news cartoons-preventing the epidemic. This paper explains the meaning construction process of the multimodal metaphor in news cartoons helps readers understand the cognitive construction process of multimodal metaphor and better interpret the metaphorical meaning of news cartoons.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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