

TOWARDS A MULTIMODAL ANALYSIS OF IMAGES IN A MEDICAL TEXTBOOK

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ABSTRACT:

In the teaching and learning process, images play a vital role in supporting the effectiveness of teaching materials. They can act as communication tools and powerful elements in constructing learners' knowledge relating to the real world that cannot be formed in classroom activities (Canning- Wilson, 1999). A descriptive qualitative research design was conducted for identifying the interactive metafunction used in the images basing on the theory of reading images (Kress and van Leeuwen, 2006) and Systemic Functional Grammar (Halliday, 1994). The data for this multimodal analysis were taken from five visual images of an English medical textbook. The findings show that the textbook dominantly used realistic images. The visual modes in the textbook complemented each other to strengthen the meaning of the scientific concept delivered to the learners. The above results have implications for conditions for the effective exploitation and incorporation of visual images from medical science into classes.

Keywords: multimodal analysis; images; interactive metafunction; medical textbook.

1. INTRODUCTION

In the procedure of learning and teaching, visual images enable students to relate to the learning materials in meaningful ways. 'In compliance with the needs of the visual world of today, illustrations or images should be able to serve as valuable teaching tools, bringing to the eye what otherwise can only be imagined' (Evan, Watson & Willows, 1978, p. 86). Therefore, visual images in textbooks can stimulate students' interest and encourage them to learn language in more critical and creative ways. 'Visual materials can be defined as facilities that can be employed by teachers and learners to enhance language learning in classrooms' (Jahangard, 2007, p. 139). 'The amount of information learned through visual means such as illustrations arguments the ability to understand, evaluate and produce visual images' (Satnley, 1996; Roohani & Saeidfar 2013, p. 82). Illustrations accompanying explanations of the text can also help students to achieve the highest level of cognitive processing. Furthermore, Canning-Wilson (1999, Tahririan & Sadri, 2013, p. 139) states that 'visual images in EFL textbooks provide excellent testing prompts; images lend themselves to be developed into tests to manipulate language structures, vocabulary, functions, situations, and skills to determine what the learner has acquired'. Therefore, visual images play a motivational role in supporting the effectiveness of teaching materials. For instance, they can help to prepare students for an exercise, task, or activity.

In analysing the images of educational books, Torres (2015) drew upon Kress and van Leeuwen's (2006) visual grammar to examine an EFL textbook taught in South Korean University context. Her findings showed "some instances where the visual message was in contradiction with the verbal message" (p.250), reflecting the embedded ideologies in the texts and images. Additionally, a number of Iranian researchers have also studied the visual and aesthetic aspects of English language teaching books in the educational system of the country. For example, Rouhani and Saidfar (2013) studied the visual components of guidance books in the previous educational system. They came to the conclusion from interviews with many teachers and students that teachers using images used in books which are related to educational goals. In another study published by Tahririan & Sadri (2013), the images of high school books in the previous educational system were comprehensively analysed using Kress and van Leeuwen (2006) model. Their findings show that the images were not fully used in the language learning process, for the reason of the problems in representing and interacting characteristics in transferring the concepts. In Vietnam, currently only a few authors are interested in developing Multimodal Discourse Analysis in Vietnamese linguistics. Ton Nu My Nhat (2017) has synthesized some theoretical and practical issues of Multimodal Discourse Analysis theory in the study of rhymes and mathematical discourse for children such as *Nursery rhymes: A comparative study from systemic functional-multimodal discourse analysis perspective*, *A multimodal analysis of mathematical discourse in English for young learners*.

However, in medical education, there is a lack of research on Multimodal Discourse Analysis in visual images of medical textbooks in relation to their functions and characteristics. It is the fact that visual images in medical textbooks are not only instructional materials which present knowledge in a systematized and clear way for educational purposes but also the determiners of the content and nature of the procedure of learning and teaching of the course. Therefore, in the light of these issues, the researcher is interested in conducting Multimodal Discourse Analysis in study of English medical textbooks concerning their roles as well as their appropriateness and suitability for educational purposes. The study aims to investigate interactive metafunction of five visual images from an English medical textbook according to the analytical framework by Kress and van Leeuwen to clarify the role of visual images in making meanings of medical textbooks. More specifically, this study sought to answer the research question *What are basic contents of the interactive metafunction of visual images in an English medical textbook?*

2. LITERATURE REVIEW

2.1. Multimodal Discourse Analysis

Firstly, the term 'modality' refers to the value or credibility of statements about the world. Modality is interpersonal rather than ideational in that it does not express absolute truth or falsehoods, it produces shared truths aligning readers and viewers with what they hold to be true for themselves, while distancing from others whose values they do not share (Kress and van Leeuwen, 2006, p.155). In terms of visual modality, visuals can represent people, places and things as though they are real.

Additionally, Multimodal Discourse Analysis deals with various forms of meaning units (language, image, sound, body language, and special arrangement), and focuses on how they work together to realize communicative function. Scholars around the world devoted much time and energy to set up their own theories of Multimodal Discourse Analysis. The study of multimodality in discourse has increased over the past two decades because it reveals the way writers articulate their intended meanings and intentions. New London Group believe that multimodality can bring benefit to teaching and learning process. This new pedagogy emphasizes on “modes of representation much broader than language alone” (New London Group, 1996, p. 64). The idea is that classroom setting can be a good place to develop communication and awareness of discourse practices that provides real opportunities for students to express their individual cultural experiences built on their linguistic resources. This communication, shaped through text, image or a combination of resources could engage learners actively, help them to effectively understand and produce texts in the target language, enhance their awareness, facilitate comprehension, and more importantly motivate them. Moreover, multimodality determines “the combination of different semiotic resources, or modes, in texts and communicative events, such as still and moving image, speech, writing, layout, gesture, and/or proxemics” (Adami, 2016, p. 451). In fact, all kinds of discourse are said to be multimodal. For instance, spoken discourse characterizes the combination of language, intonation, voice quality, gestures, facial expressions and posture in addition to some aspects of self -representation such as dress and hairstyle. On the other hand, written discourse on the other hand includes the combination of language, typographic expressions, illustration, layout and colour. Multimodal discourse analysis is essentially concerned with the theory and analysis of semiotic resources and the semantic expansions which occur as semiotic choices combined in multicultural phenomena. Researchers in this area seek to ‘identify the influence of mode on meaning within a given context, focusing on co-occurrence interaction between multiple semiotic system’ (Baldry & Thibault, 2006, p. 31).

2.2. Visual Grammar Paradigm

Visual Grammar is a framework developed by Kress and van Leeuwen. It is noteworthy that the first version of the framework appeared in 1996 and was modified in 2006. In essence, their paradigm was developed to deal with the analysis of images. Their work can be considered as an adaptation of Halliday’s Systemic Functional Grammar in which he considered the different metafunctions of language. The latter included three main metafunctions: the ideational, the interpersonal and the textual. As for the ideational metafunction, Halliday argues that “any semiotic mode has to be able to represent aspects of the world as it is experienced by humans” (Kress and van Leeuwen, 2006, p. 42). In other words, language is a characterization of what is found in the real world. The interpersonal metafunction on the other hand explores the existing relationship between the producer of a given sign, the sign and the receiver of the sign. Finally, the textual metafunction of language deals with the cohesive devices used to convey a given message (Kress and van Leeuwen, 2006). In their Grammar of Visual Design developed

for the analysis of images, Kress and van Leeuwen (2006) distinguished between three different types of meaning (also called metafunctions), namely, representational, interactive and compositional. The framework is illustrated below in figure 1.

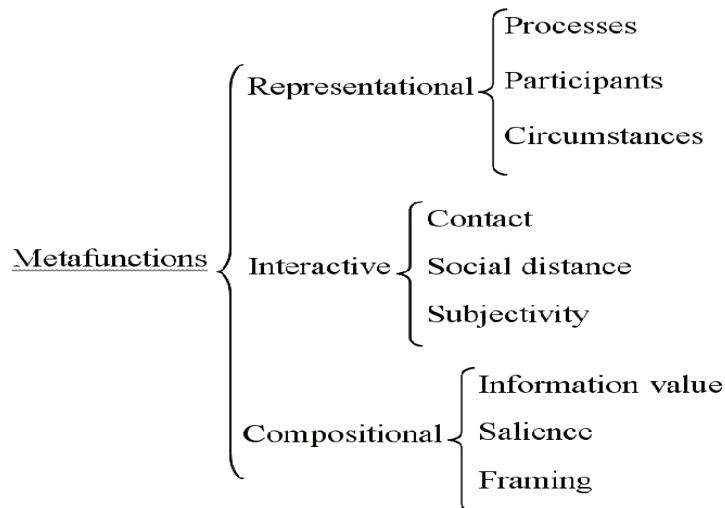


Figure 1: Kress and van Leeuwen’s metafunction framework (2006)

The interactive metafunction will be the main focus of this study. It includes different elements: contact, social distance and subjectivity. In this respect, the image designer has the possibility of including the visual element of gaze in a given image so that this image may be regarded as a “demand” image or an “offer” image in case the visual element of gaze is not included in the image. As for the size of frame, the designer may adopt a close shot which is characterized by the distance in which one participant may hold or grasp another participant. Such distance may be regarded as an indication of the existing relationship between the participants themselves and the participants and the audience. Additionally, perspective refers to the point of view or angle from which an image is produced. The selection of a given angle is said to express a subjective attitude that should be explored. As far as modality is concerned, it refers to the degree to which a given image is real and authentic. Accordingly, assessing the modality of a given image involves the consideration of different factors such as colours, contextualization and representation.

3. METHODOLOGY

3.1. Sample and Data Collection

In an attempt to answer the aforementioned research questions, a total of five English visual images dealing with medical topics were put under scrutiny. Accordingly, the data were selected from an English medical textbook based on availability by Bonnie F. Fremgen, Suzanne S. Frucht (2016). In fact, it is worth mentioning that the selection of the visual images was based on the medical issues that are currently used by students of a medical university in Vietnam as one of their learning sources.

3.1. Data Analysis

The research employs a descriptive qualitative research design. With the intent of answering the research question, a scrutinized qualitative analysis was conducted for

each visual image in an English medical textbook using the Visual Grammar paradigm developed by Kress and van Leeuwen model of visual grammar.

4. FINDINGS & DISCUSSION

The analysis of the interactive metafunction in an English medical textbook began by determining the image contact, act and gaze which constituted the first element of the interactive metafunction in Kress and van Leeuwen's (2006) Visual Grammar framework. In fact, the presence or absence of gaze is said to determine whether the image fulfills the act of "demand" or "offer". Alternatively, figure 1 and figure 2 incorporated the visual element of gaze. As such, the represented participant appeared to be aiming at conveying a given message by means of their gaze. In figure 1, the patient was placed on a treadmill and then subjected to steadily increasing levels of work. The physician monitored his condition for evaluating cardiovascular fitness. In figure 2, a nurse and a medical assistant are reviewing a patient's chart and planning her daily care.



Figure 1: Healthcare workers and patients
(Bonnie F. Fremgen, Suzanne S. Frucht, 2016, p.163)



Figure 2: A nurse and medical assistant review a patient's chart
(Bonnie F. Fremgen, Suzanne S. Frucht, 2016, p.15)

The second step in examining the interactive mode of the images is distance that relates to the level of social space and closeness between the images and the viewers. This can be seen in how much body is shown in the images in close-up, medium and long shots. Kress and van Leeuwen's theory (2006) proposes that close-up images represent intimate relationships between images and viewers, while medium shots frame a social relationship and long shots have an impersonal meaning. However, in this study, the analysis was limited to two types of distance, medium and long. Of the five images in an English medical textbook, 3 images (60%) were identified as long shots and 2 (40%) as medium.

The third step is analysing the perspective of the images from a frontal eye-level. The frontal level signifies viewers' involvement and inclusion, and the eye-level perspective conveys power equality between images and the viewers (Kress and van Leeuwen, 2006). This study found all images were represented in a frontal and eye-level perspective, indicating that there is no power discrepancy between images and the viewers, as students are able to make connection with the images. For example, figure 3 incorporated only one represented participant displayed as an anatomy illustration of the position of the lungs within the thoracic cavity.

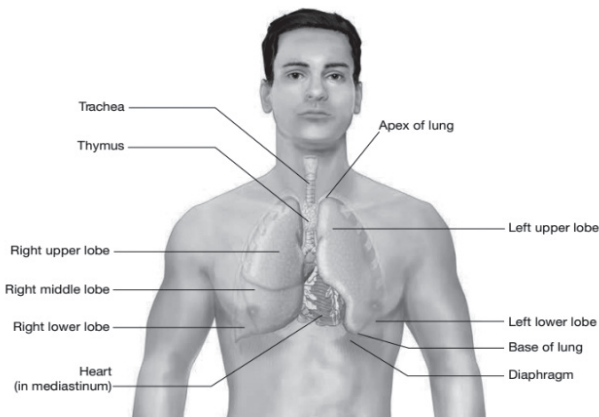


Figure 3: Position of the lungs within the thoracic cavity
(Bonnie F. Fremgen, Suzanne S. Frucht, 2016, p.229)

With the intent of analyzing the set of processes involved in medical images, it seemed that two main processes were involved, namely, conceptual and reactional. Figure 4 including anatomy images 3 and 4 did not exhibit a dynamic action in which one represented participant performed a given action on the other. For instance, image 4 showed anatomical and common names for the pectoral girdle and upper extremity. The pectoral girdle consists of the clavicle and scapula bones. It functions to attach the upper extremity, or arm, to the axial skeleton by articulating with the sternum anteriorly and the vertebral column posteriorly. The bones of the upper extremity include the humerus, ulna, radius, carpus, metacarpus, and phalanges. Image 5 showed the internal view of the heart illustrating the heart chambers, heart layers, and major blood vessels associated with the heart. As such, the images might not be considered as encompassing a narrative process. On the other hand, the absence of the visual element on the part

of the represented participant eliminated the assumption of having a reactional process in the image. As a result, the images appeared to carry a conceptual process in which a static and timeless representation was displayed which was the case in the image under scrutiny. In brief, such visual configuration brought the stability, invariability and steadiness of the image.

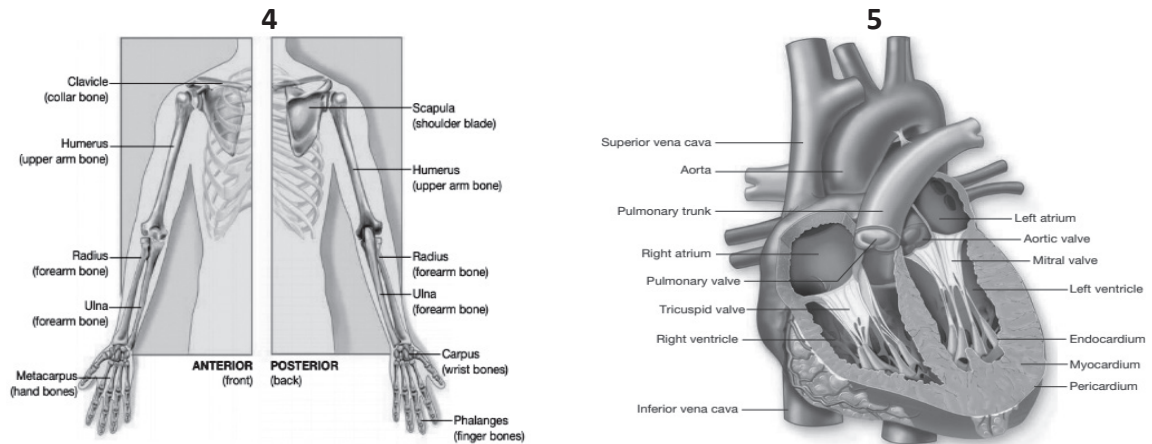


Figure 4: Anatomy illustration

(Bonnie F. Fremgen, Suzanne S. Frucht, 2016, p.92, p.142)

However, figure 2 showing a nurse and a medical assistant who are reviewing a patient's chart and planning her daily care included a reactional process. Such a process was realized when the vector consisted of an eyeline or gaze of a given represented participant. By the same taken, the represented participant and his gaze formed "the phenomenon" while the interactive participants were the "reactors" using Kress and van Leeuwen's (2006) terminology.

The last step is modality analysis. To show the level of image credibility, two categories were used, colour and contextualisation. In terms of colour, all images use full colour saturation images. According to Kress and van Leeuwen's theory (2006), the absence of colour identifies particular meaning and a lowered level of authentic image representation. The level of colour modality in the English medical textbook is high. Regarding contextualisation, the study showed that all images contained a background. However, some images in the textbook represented real life activities (see figure 1 and 2). Thus, the analysis of images based on contextualisation modality indicates that they represent authentic meaning in real.

5. CONCLUSION

The findings of each metafunction of visual images showed that with regard to the interactive meanings characterized in terms of social distance and perspective, the images render messages of equality and objectivity which warrant the association of medical students with the images. This study was conducted in accordance with its objectives but there were some unavoidable limitations. Firstly, this is the first study the researcher has conducted on visual images in an English medical textbook. Therefore, there is a need for a deeper understanding of how to analyse these. Additionally,

analysis of the pedagogical purposes of visual images in English medical textbooks, particularly in Vietnam, is new and no studies on this could be found. Thus, a much more comprehensive study or collaboration with other researchers is needed to find different interpretations of visual images in English medical textbooks. Moreover, this study is only based on one method of data collection (analysis of visual images). Thus, additional data collection could be needed, such as interviewing lecturers and students who are using these medical textbooks and working with these visual images, as well as from classroom observations to scrutinize how visual images can enhance language teaching and learning processes in classrooms. In summary, this study may not only provide useful information for textbook developers, illustrators, teachers and students but also contribute to enrich the existing literature of discourse analysis on medical images, especially basing on Multimodal Discourse Analysis which could not be seen in the majority of studies on medicine.

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**PHÂN TÍCH ĐA PHƯƠNG THỨC HÌNH ẢNH
TRONG GIÁO TRÌNH Y KHOA**

Tóm tắt:

Trong quá trình dạy và học, hình ảnh đóng một vai trò quan trọng trong việc hỗ trợ tài liệu giảng dạy một cách hiệu quả. Hình ảnh có thể làm công cụ giao tiếp và là thành tố chiếm ưu thế trong việc kiến tạo tri thức của người học liên quan đến thế giới thực mà không thể hình thành trong các hoạt động lớp học (Canning- Wilson, 1999). Nghiên cứu mô tả xác định siêu chức năng tương tác được sử dụng trong hình ảnh dựa trên Lý thuyết phân tích hình ảnh của Kress và van Leeuwen (2006) và Ngữ pháp chức năng hệ thống của Halliday (1994). Phân tích đa phương thức sử dụng năm hình ảnh trực quan trong giáo trình tiếng Anh chuyên ngành Y và cho thấy giáo trình sử dụng hình ảnh thực tế một cách chủ đạo. Các phương thức trực quan trong giáo trình bổ sung cho nhau để củng cố ý nghĩa của khái niệm khoa học được truyền đạt tới người học. Kết quả nghiên cứu tạo điều kiện cho việc khai thác và lồng ghép hiệu quả các hình ảnh trực quan từ y khoa vào bài giảng trong lớp học.

Từ khóa: phân tích đa phương thức; hình ảnh; siêu chức năng tương tác; giáo trình y khoa.