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A Cognitive Semantic Study of Selected English Visual Medical Metaphors

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Abstract:

This study is an attempt to analyze a number of selected English visual medical metaphors in the light of three cognitive semantic theories: Lackoff & Johnson's (1980) Conceptual Metaphor Theory (CMT), and their (1987) Image Schema Theory (IST), as well as Fauconnier and Turner's (2002) Conceptual Blending Theory (CBT).

The study is based on the hypotheses that the selected cognitive theories can account for the cognitive realty and meaning construction in visual medical metaphors, and the possibility of having of more than one interpretations of these selected metaphors. The study also hypothesizes that that linguistic and extra linguistic elements have a complementary role in conveying the metaphor's intended message.

To achieve the aims of the study and verify its hypotheses, five medical visual metaphors have been selected from two newspapers: Chicago Tribune, and the New York Journal. The selected medical posters have been analyzed in the light of an eclectic model based on Lackoff & Johnson's (1980) CMT, and their (1987) IST, as well as Fauconnier and Turner's (2002) CBT.

The results of analyzing the selected metaphors show that the mechanisms of the selected models can efficiently reveal the cognitive conceptual realty of visual medical metaphors, and that CBT is the most frequent applicable one. The results also show that viewers can variously construe these metaphors due to the differences in their background knowledge.

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Introduction

Lackoff & Johnson's (1980) CMT, and their (1987) IST, as well as Fauconnier and Turner's (2002) CBT have attracted scholars' attention in different fields of linguistics, yet there still exist some areas which are considerably virgin as far as these theories are concerned. Among these areas are visual medical metaphors with which this study is concerned.

The problem discussed in this study can be represented by the sort of controversy that may exist over the answers to the questions stated below:

1. Can the selected cognitive theories CMT, CBT, IST account for the cognitive realty and meaning construction in visual medical metaphors?
2. Which theory is more frequently applicable to visual metaphors?
2. Is it possible to have more than one interpretation of a medical metaphor due to applying the selected theories by readers or viewers?

The study aims to (1) bring the reader into a closer acquaintance with the conceptual structure of English medical metaphors, (2) investigate the efficiency of the selected models to reveal the cognitive reality of the phenomenon under study, (3) find out whether the linguistic and extra linguistic elements in visual metaphors have a complementary or exclusive role in conveying the intended message of visual medical metaphors, and (4) the possibility of multiple construals of the selected metaphors.

The study hypothesizes that (1) CM, CB, IS and their mechanisms can account for the cognitive realty and meaning construction in visual medical metaphors, (2) CBT is more frequently applicable to visual metaphors and (2) applying the selected theories by readers or viewers can lead to more than one interpretation of a medical metaphor.

2. Metaphor in Cognitive Semantics

Cognitive linguistics is a field of linguistics which is concerned with studying metaphors since people use their cognitive abilities to conceptualize and understand the metaphorical expression. People daily encounter a countless number of situations in which certain terms are used metaphorically, but at first sight they are not felt to be metaphorical expressions

Metaphor, traditionally was considered as a literary expression, but nowadays it covers almost all aspects of interaction in the fields of education, politics, Medicine, economy, marketing, etc., though many be unaware of this.

According to Saeed (2003), there are two views of metaphor: a classical and a romantic view. The former treats metaphor as decoration added to the normal use of language. On this basis, it is not a part of language.

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Let's consider the following example:

Jane was *overcome* by grief. -1

The word 'overcome which belongings to the domain of fighting (defeat somebody) means 'be overwhelmed emotionally'. Since many negative emotions are seen as concrete entities and people struggle with them, the word overcome is seen as a metaphorical expression. Thus, this can be described as EMOTIONS ARE OPPONENTS (Radden & Dirven, 2007). Thus, one can easily see that metaphor is the process of concretization of abstract things by analogy.

Metaphor is a contextualized notion since its interpretation heavily depends on context. Being tied to context, certain metaphors may not be identically understood universally. However, many of them can have a universal construal. Cognitive semanticists argue that metaphors exhibit characteristics and systematic features some of which can be looked at under the headings of conventionality, systematicity, asymmetry, and abstraction. Conventionality, raises the issue of the novelty of metaphor. Some writers would claim that some metaphors have become dead. Cognitive semanticists argue against this. They point out that even familiar metaphors can be given a new life, and thus retain their metaphorical status. For example, in the UP–DOWN metaphor, *My spirits rose* may be considered as a dead metaphor, yet this general metaphor is continually being extended.

The second feature, systematicity, refers to the idea that a metaphor does not just set up a single point of comparison: the features of the source and target domain are joined so that the metaphor may be extended, or have its own internal logic. Lakoff and Turner (1989) argue, for example, that the metaphor *life is a journey*, pervades our ordinary way of talking. Thus, birth is often described as arrival as in *The baby is due next week*, or *she has a baby on the way*.

Another example comes from the role of metaphor in the creation of new vocabulary as in coining the term computer virus for a harmful program. This coining is based on a conceptual model of biological viruses which is generalized or schematized away from the biological detail (Fauconnier, 1997, p. 19). This metaphorical mapping between a health schema and a computer domain can be viewed as a form of analogical mapping (Gentner 1983; Holyoak and Thagard 1995). A whole system of lexical innovations is licensed so that files can be said to be "infected"; files downloaded from the internet might be "contagious"; the anti-virus programs are said to "disinfect" programs, and may place them in special areas of memory called "quarantine. Systematicity has been an important focus in cognitive semantic views of metaphor.

Asymmetry means that metaphors are directional.They provoke the listener to transfer features from the source to the target domain. The metaphor LIFE IS A JOURNEY can be taken as an example, this metaphor is asymmetrical and the mapping does not work the other

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way around. Journeys in terms of Life are not conventionally described. So, it sounds odd to say *Our flight was born a few minutes early* or *by the time we got there, the boat had died.* . Abstraction is related to asymmetry. It is noted that a typical metaphor uses a more concrete source to describe a more abstract target. Again, the LIFE IS A JOURNEY metaphor exhibits this feature. The common daily experience of physically moving about the earth is used to characterize the mysterious processes of birth and death, and the perhaps equally mysterious processes of ageing, organizing a career, and so on.

3. On Medical Metaphor

Medicine is strewn with mechanistic language and concepts. For example, the metaphor *The body is a machine* suffuses much of the language of pathology and physiology. Seeing the body as a machine has been useful. The heart is much like a pump and treating it as one has provided many insights. "

Medicine has become dominated by a mechanistic hubris, which sees machines and engineered solutions to ill health as the favourite way forward. All this, of course, begs the question of the relation between language and the things it describes. Some feel that language may actually prevent its native speakers from perceiving the world in ways that are quite "normal" in other tongues.' According to this view, language determines reality. A more explanation is that language and our perception of the world evolve together, both influencing each other.

The vocabulary of medicine is certainly one example of the way linguistic forms affect our perception of the world. As Dixon refers to 20 rubrics for different types of respiratory infection, but only one word for poverty. Differentiating respiratory syncytial virus from mycoplasma thus becomes possible, but we still have only general terms with which to express, say, overcrowding

4. Medicine and Emotion

Many of the phrases we use to talk about feelings depend on two assumptions: emotions are fluids and intensity is temperature. Examples of metaphors showing patients' emotions are:

2.He was swamped with feeling.
3. She was bubbling over with joy.
4.I nearly exploded with rage.
5. They were boiling over with excitement.
6. They've channeled their feelings into other things.
7. He's emotionally volatile.

Such metaphors are dealt with by trying to keep the emotional temperature as low as possible. Apparently the mature doctor should be able to control the emotional temperature of

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even the most tragic situations so that at least his or her feelings remain nicely controllable as frigid blocks of ice. The metaphors stated above are pervasive and form the basis of many of our concepts about medicine. They are often used among patients too, and form the normal, common sense way of thinking and talking about ill health.

5. Function of Medical Metaphors

Tongeren (as cited in Shiffrin et al, 2011, p.484) states that metaphors can be viewed as surface representations of an underlying conceptual system. He classifies metaphor according to the salience of metaphorical terms in medical text. According to their functions metaphorical idioms in medical texts are classified into three types: catachretic, didactic, and theory-constructive.

Catachretic metaphor is applied to objects or phenomena that are formerly known. It fills gaps in a vocabulary, i.e. the initial blood vessels as rivers metaphors, representing the conceptual metaphor *Anatomy is a landscape*. On the other hand, didactic metaphor presents new concepts by means of familiar concepts, e.g. the transcription machinery of messenger RNA which includes both *The body is a machine* and *A genome is a text*. In addition, theory-constitutive metaphors are subject to phenomena that are not yet known. So, to structure them and find out what they are like, they can't be substituted by literal terms.

6. Visual Metaphors

Langacker argues that cognitive grammar does not "claim that all meanings are based on space or visual perception, but the visual metaphor does suggest a way to classify the many facets of construal, if only for expository purposes". Langacker indicates the importance of visual metaphor as an alternative way to stimulate meaning (Langacker,2013:55). Day after day metaphor proves its unique nature, while it has been an important figure of speech with informal linguistics, it is now a paramount topic within CL. Nowadays, metaphor is the core of another type of researches that focus on visual metaphor including "monomodal" and "multimodal" metaphor. These types of metaphors are found everywhere such as political cartooning, advertising (Ojha, ,2013, p.XIII).

Negro (2017,pp.119-126) defines visual or pictorial metaphor as a "nonverbal manifestation of metaphorical thought, where one or both concepts of the metaphor, the target and the source, are depicted in images". On the other hand, "a visual metaphor is the representation of a person, place, thing, or idea by means of a visual image that suggests a particular association or point of similarity. It's also known as a pictorial metaphor and analogical juxtaposition" (https://www.thoughtco.com). In recent years, the major role of visual metaphor in modern culture, is to reflect advertising, political, social, medical or even global issues as and so on, in more legible way than verbal.

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Visual metaphors follow the same principles as conceptual metaphors do but from a visual perspective. Kaplan (2005:168) points that the essential components of a metaphor can be applied for both linguistic and nonlinguistic types, but the process of identifying is more difficult with visual. This type of metaphor has the ability to squeeze large amounts of conceptual data within its visual structures, but it requires wide background knowledge to analyze its content. Novelty and systematicity are general features of verbal metaphor which apparently can also be part of visual metaphor structures. They reflect the metaphor nature that may be extended into novel senses where the features of its domains are not only joined but may be extended in more concepts. (Saeed2016, p.372)

Kaplan (2005, pp. 167-169) distinguishes two types of non-linguistic metaphor: the metaphors used in artistic presentations and those used for rhetorical purposes. Examples of the first type are found in graphic designs, films, paintings, sculptors, etc., while the second type are found in advertising. Kaplan shows that the essential components of visual metaphors are the same components of linguistic types, since the former also arises from mapping two domains (target and source domains). At the same time, these types of visual conceptual structures follow the same framework of conceptual linguistic structures in the human mind to evoke new sensory perceptions in the viewer. In discussing the visual elements of metaphor, Kaplan depends on the theories of CS one of which is Fauconnier and Turner's (1995) CBT.

In a cartoon by El Roto (2003), (see Figure 1), a syringe is depicted with a television tower instead of a needle. Kaplan shows that the essential components of visual metaphors are the same components of linguistic types, since the former also arises from mapping target and source domains. These types of visual conceptual structures employ the same framework of conceptual linguistic structures in the human mind to give rise to new sensory perceptions in the viewer.

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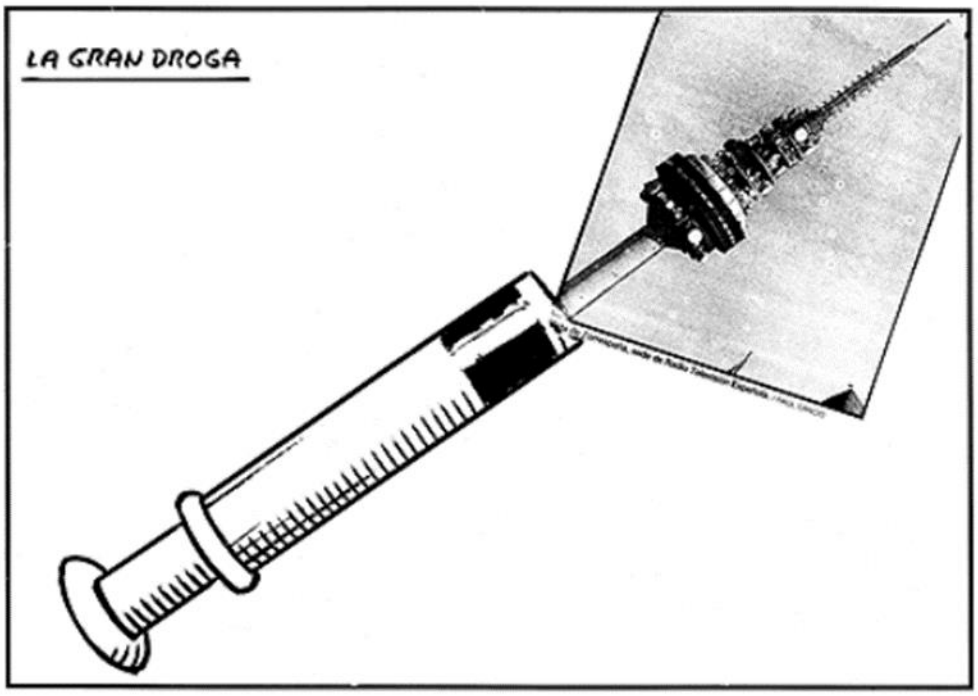

Figure 1 Cartoon by El Roto, El País (6 June 2003.

7. Comprehension of Visual Metaphor

The comprehension of visual metaphor may involve a stable conceptual
)as in: THE EARTH IS A SAUCEPAN (Figure 2

Here, the reader finds this metaphor in a newspaper and infers that its author intends to communicate some information by means of this wordless cartoon. (S)he perceives the cartoon's iconic characters through bottom-up and top-down matching with previously stored prototypical visual references of the item(s) depicted. A cooking pot is identified. The continents of the earth are also identified. These are placed on the pot.

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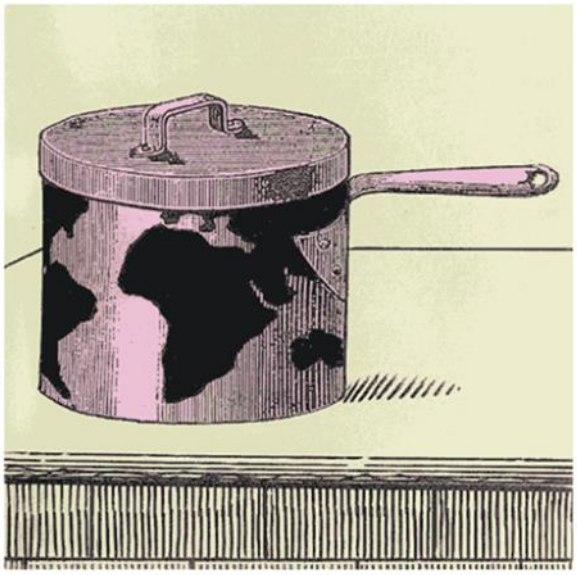
IRAQI Academic Scientific Journals



Cartoon by El Roto, El País (2002). Figure 2

An incongruity arises during the perception of the elements of the image. The Earth and a saucepan cannot be fused in one image. There is an anomalous visual arrangement regarding the mental storage prototypical combinations of objects mapping together (what above was labeled "visual syntax" of the image) that works as an ad hoc pointer that alerts the reader to an intended metaphoric interpretation beyond the simple depiction and perception of the drawing in the cartoon. The reader's hypotheses at this stage will prepare the ground for a fully inferential stage of visual metaphor comprehension, and should include the following conclusions: (a) the saucepan is the source image; (b) the Earth is the target image (a probable conclusion that the reader gets in a relevance seeking procedure); (c) the encyclopedic referent EARTH has qualities of the encyclopedic referent SAUCEPAN; and (d) these are the prototypical referents intended by the author; the images of the Earth and the saucepan do not stand metonymically for other referent.

8. Sampling and Data Collection

The data adopted in this study consist of 5 visual medical metaphors randomly selected from Chicago Tribune Newspaper and the New York Journal.

9.The Adopted Model

The model adopted in this study is eclectic. It is based on Lakoff and Johnson's (1980) CMT, and Fauconnier and Turner's (2002) BT. The reason behind adopting these two models is that they are equipped with the mechanisms that can account for meaning construction in medical

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IRAQI Academic Scientific Journals

metaphors. It can also be argued that there is a relationship between BT and CMT, and that the two approaches are complementary. The cross-domain relationships identified by CMT shape which constrain the more complex process of conceptual blending.

10. Method of Analysis

Each metaphor is analyzed first by considering its medical and etymological background, and the posters where it occurs. Then, the adopted model will be applied to account for meaning construction in the metaphor understudy.

11.Analysis of the Selected Metaphors

11.1. Analysis of Metaphor No.1

Figure3https://www.needpix.com/photo/download/1867597/manipulation-eye-camera-lens-woman-free-pictures-free-photos-free-images-royalty-free

11.1.1 Introductory Note

This poster is quoted from (needpix.com/photo/1867597). It was published on May 18, 2020. It is a blended image of the human eye and camera lens.

11.1.2 Analysis of Network

Journal of Diyala For Human Research
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IRAQI Academic Scientific Journals

This metaphorical construction can best be accounted for by CBT. The network consists of two inputs. The first is that of human eye which is a sensory organ that responds to light and allows us to see. It has the elements of sensitivity, determination. The second input is the camera which is the machine used to record pictures. It has the elements of electronics, capture, reliability, figuration, pone hole, accuracy, light enter through, aperture, focus light and image on film. Lens can be fixed. The generic space includes the shared elements in both two inputs: focusing light, image, limited convey, lens, having sensitive surface, regulation of the movement. The blended space is that EYE IS THE IMAGE OF THE BRAINAS AS THE CAMERA IS THE EYE OF THE OUTSIDE SIGHTING.

11.2. Analysis of Metaphor No.2

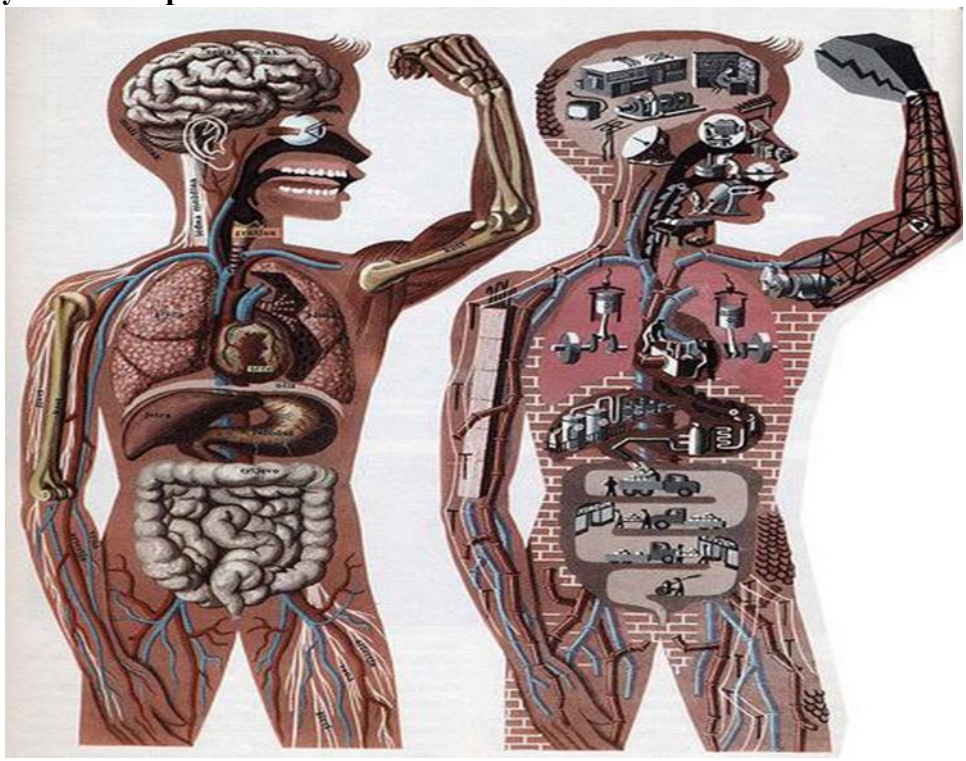

Figure 4 https://www.pinterest.com/pin/423619908671487330

11.2.1 Introductory Note

A machine is any physical system with ordered structural and functional properties. It can represent a man-made or naturally occurring molecular machine that uses force to perform an action. The image above shows a metaphorical image of the human body as a machine. This image was designed by Louis Tuchman on May 15, 2011. Through this poster, Tuchman tries to

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IRAQI Academic Scientific Journals

protect the strategic and financial interests of Herrick's clients around the world by clarifying and addressing the tax implications of transactions (http://www.pinterest.com).

11.2.2 Analysis of Network

This visual metaphor is based on blending the natural image of a human being in which his organs are clear; the brain, eyes, teeth, lungs, ears, etc. To show the significant function of each of these organs, the designer of the poster draws an imaginary poster of human body which consists of a number of machines and instruments each of which corresponds to a certain human organ in terms of function. For instance, camera corresponds to eye since both are responsible for seeing images and things around. The radar corresponds to human ear since both deal with receiving sounds and send them somewhere. The human ear receives the sounds and sends them to the brain for interpretation. Similarly, the radar sends the sound waves to specific computer for interpretation. The same correspondence applies to all the other human organs and their equivalent machines and instruments.

The human body image represents the first input, while the imaginary image represents the second input. The emergent structure occurring in the blended space is LIKE MACHIENES, EACH OF HUMAN BODY ORGANS HAS A SPECIFIC FUNCTION. SO WE SHOULD TAKE CARE OF THEM TO KEEP THEM HEALTHY.

11.3. Analysis of Metaphor No.3

Figure 5 https://www.istockphoto.com/search/2/image?phrase=clouded+mind

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المجلد الأول العدد 96 لسنة 2023
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IRAQI Academic Scientific Journals

11.3.1 Introductory Note

This poster was published by (istockphoto.com) on June 19,2013. It is an abstract image of a woman who seems to suffer from a medical condition that causes altered consciousness or what is called a "clouded sensorium". A depressed girl suffers from temporary memory loss and confusion. Acute decline in sensorium is a commonly encountered symptom in the neurocritical care units, the differential for which is enormous. The causes may range from easily reversible (such as hypoglycemia) to relatively permanent (such as stroke), and from benign (such as intoxication) to potentially life-threatening (such as meningo-encephalitis) etiologies. A streamlined approach to such patients is necessary for a systematic diagnostic workup and appropriate management.

11.3.2 Analysis of network

This metaphorical construction is based on container image schema. It is based on the ad hoc image of human head as being a container that contains his mental ability. When this part of the body is affected, the whole body and life of the human would be affected. The designer of this poster tries to picturize the psychologically ill condition of the virtual patient in the poster by mapping the blurred, clouded spaces coming out of the patient's head into his psychological conditions. The image of the clouded sensorium with blurred borders is used here to metaphorically visualize the unclear structure of the patient's mental state.

11.4. Analysis of Metaphor No.4

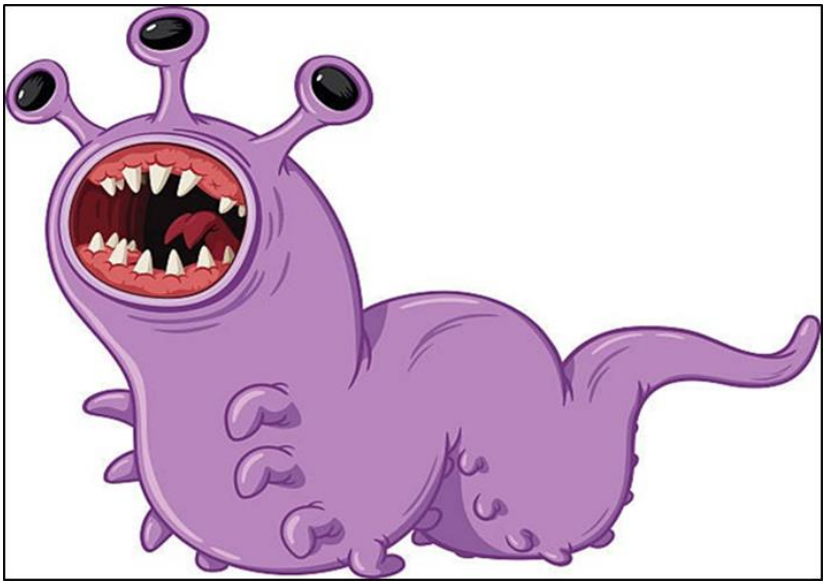

Figure 6 https://images.app.goo.gl/tvsLmRA2H2N3y5rk8

Journal of Diyala For Human Research
Volume 1 Issue96- 2023
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11.4.1 Introductory Note

This poster was published in New York Journal, on June 18, 2016. By. It is about parasite that can cause disease in humans. Generally, there are three main classes of parasites: protozoa, helminths, and ectoparasites. They can multiply in humans, which contributes to their survival and also allows serious infections to develop from just a single organism. Transmission of protozoa living in a human gut to another human typically occurs via a fecal-oral route (e.g., contaminated food or water, or person-to-person contact). Protozoa living in the blood or tissues of humans are transmitted to other humans by an arthropod vector, e.g., through the bite of a mosquito or sand fly (www.sequre.eu).

11.4.2 Analysis of Network

Due to their invisible size which makes it impossible for humans to see these parasites and realize their danger, the designer of the poster here tries to warn the text receiver and enable him to see and realize the danger of these creatures by blending the image of these parasites with a compounded image of three creatures. The teeth are those of a wild dangerous animal. They are quoted here to indicate that these parasites are as dangerous as any wild animal. The image of the tongue is that of a snake, while the three horns are similar to those of Corona virus. This horrible compound image represents the first input which includes the elements of agent (dangerous creature), act of attacking and killing human, victim (human). The second input is that of the unseen parasites which includes the elements of agent (the unseen parasite), act of affecting human, victim (patients). The generic space includes the elements that are shared by these two inputs: agent, danger, act of affecting and killing, danger. The blended space includes the emergent structure PARASITES ARE AS DANGEROUS AS WILD ANIMALS. THEY ARE SAMALL IN SIZE, YET THEY CAN CAUSE DEATH TO US.

11.5. Analysis of Metaphor No.5

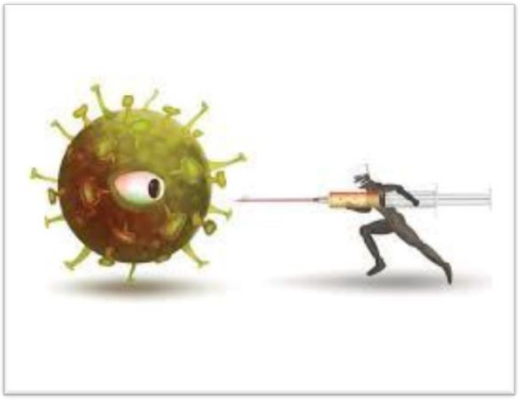

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Figure 7 https://www.japantimes.co.jp/opinion/2020/03/11/commentary/japan-commentary/fighting-covid-19-story-stupid

11.5.1 Introductory Note

The poster was published by The Chicago Tribune. on May 05, 2020 during coronavirus pandemic spread around the world. Medical workers were at the forefront of the fight against COVID-19. They were christened COVID-19 warriors almost all over the world. The warriors fought a. novel microscopic enemy, invisible to the naked eye. So, the fight was on unequal terms. Most cases were discovered after the individual started showing infection. (istockphoto.com).

11.5.2 Analysis of Network

This metaphor is based on blending the measurements taken against Corona virus to the concept of battle. As the poster shows, the doctor is metaphorically portrayed as a fighter holding a syringe which is pictured in the form of a gun. The fighter directs his gun to the enemy represented by the shape of a crown virus. So, the struggle against the virus is just like fighting an enemy in the field battle. The network of this blended metaphor consists of two inputs. The first is that of a battle which consists of agent (fighter), weapon (gun), enemy, act of fighting. The second input is that of fighting a silent enemy represented by the virus. It consists of agent (fighter), enemy (Corona virus), weapon (medical instruments), act of fighting. The generic space includes the shared elements of agents (doctor and fighter), act of fighting, battle, enemy. The blended space contains the emergent structure MEASUREMENTS AGAINST CORONA VIRUS ARE LIKE FIGHTING AN ENEMY IN THE BATTLE FIELD. CORONA VIRUS IS AS DANGEROUS AS AN ENEMY TO BE FOUGHT.

12. Discussion of Results

The study results are discussed here in the form answers to the research questions raised in the in the introduction:

1. Can the selected cognitive theories (CM, CB, IS) account for the cognitive realty and meaning structure of visual medical metaphor?

The study results show that visual metaphors are highly structured images that allow viewers to understand one concept in terms of another. They are typically more implicit and complex. They can allow for several possible interpretations based on the viewer's background knowledge. In addition, information provided in visual metaphors can elicit more cognitive elaboration and activate higher recall of relevant knowledge. The IS provides a means of understanding some aspects of meaning construction in visual medical metaphors. For example, metaphor No (3) is based on container image schema. It is based on the ad hoc image of the human head as being a container that contains his mental ability.

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As for CBT, the study results show that the content for the CB can provide a template for source and target domains in the CM. It facilitates the analysis of medical metaphors. Recognizing the two input spaces helps to identify source and target domains in concepts. CB focuses on the ability to combine elements from familiar conceptualizations into new and meaningful once.

2. Is it possible to have more than one interpretation of a medical metaphor due to applying the selected theories by readers or viewers?

The analysis of the selected metaphors shows the possibility of having more than one interpretation of the same medical metaphor. This can be due to the difference of individuals' background knowledge which is a necessary prerequisite for processing visual metaphors. Metaphorical images, including medical ones, are the result of concrete likeness, embodiment, and recurring imagery. Despite the embodied nature of many metaphorical motivations, understanding metaphor is not always easy. Metaphorical conceptualizations can be culture-dependent or require specialized knowledge to grasp their meaning. Pictures, portraits, and realistic paintings are the prototypes of iconic signs. However, symbolic images can be interpreted very differently, even by people with similar cultural values.

13. Conclusions

The findings of the study lead to the following conclusions:

1.The mechanisms of the selected theories can efficiently reveal the cognitive reality and the process of meaning construction in English visual medical metaphors. This verifies the first hypothesis adopted in this study.

2.CBT is more frequently applicable to medical metaphors than IS and CMT. This could be attributed to the fact that human beings tend to blend the thoughts and mental images they experience. This verifies the second hypothesis adopted in the study.

3.Visual metaphors are highly structured images that increase message effectiveness by producing greater affect, improving the perception of the message, increasing elaboration, and potentially influencing beliefs and attitudes. They are more implicit and complex.

4. Visual metaphors can allow several possible interpretations based on the viewer's background knowledge. This verifies the third hypothesis adopted in the study.

4. Verbal and nonverbal elements in visual medical metaphors have a complementary role. They contribute together to conveying the same intended message of visual metaphors

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دراسة دلالية معرفية لمجموعة مختارة من الاستعارات الطبية البصرية الإنجليزية

الملخص :

هذه الدراسة هي محاولة لتحليل عدد من الاستعارات الطبية البصرية الإنجليزية المختارة في ضوء ثلاث نظريات دلالية معرفية: نظرية الاستعارة المفاهيمية (1980) لاكوف وجونسون (CMT)، ونظرية مخطط الصورة (1987) الخاصة بهم (IST)، مثل وكذلك فوكونير وتورنر (2002) نظرية المزج المفاهيمي (.CBT)

تستند الدراسة إلى فرضيات أن النظريات المعرفية المختارة يمكن أن تفسر الواقع المعرفي وبناء المعنى في الاستعارات الطبية المرئية ، وإمكانية وجود أكثر من تفسيرات لهذه الاستعارات المختارة. تفترض الدراسة أيضًا أن العناصر اللغوية والعناصر اللغوية الإضافية لها دور مكمل في نقل الرسالة المجازية المقصودة.

لتحقيق أهداف الدراسة والتحقق من فرضياتها ، تم اختيار خمس استعارات بصرية طبية من صحيفتين: شيكاغو تريبيون ونيويورك جورنال. تم تحليل الملصقات الطبية المختارة في ضوء نموذج انتقائي يعتمد على CMT1980Lackoff & Johnson's (، و IST (1987) ، وكذلك Fauconnier and Turner's CBT.2002))

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الكلمات المفتاحية: دراسة دلالية ، دراسة دلالية ، الاستعارات الطبية ، البصرية الإنجليزية .

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