International Journal of Arts, Humanities and Social Studies
Website:https://www.ijahss.in/
e- ISSN: 2582-3647
Volume 3; Issue 1; Jan-Feb 2021; Page No. 19-26

Cognitive Processing of Visual Structure and the Mediator Role of Verbal Text

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ABSTRACT
This study investigates the effect of visual structure presented in visual metaphor on the viewer's cognitive elaboration. It also attempts to examine the role of verbal text in enhancing the cognitive elaboration of visual structure. To this end, this research uses Phillips and Mc Quarrie's [1] typology of visual metaphor which offers three types of visual structure; namely: juxtaposition, fusion and replacement. The first finding shows that viewers enjoy processing incongruity presented in less complex visual structure, i.e. juxtaposition and fusion. However, a high level of incongruity in visual structure; notably replacement, requires more cognitive elaboration and extra mental effort, and will lead the viewers to opt out from processing the visual structure. As far as verbal text is concerned, the main results show that the introduction of a verbal text has a significant effect on processing complex visual structure, i.e. replacement. For visual structures of juxtaposition and fusion, the presence of verbal text does not have a significant effect on processing visual structure. Consequently, the main finding of this study lies in the fact that viewers enjoy solving incongruity in print advertisements. However, when the level of incongruity increases and becomes too complex to process and understand, the viewer will simply opt out from processing the metaphorical image. The introduction of verbal text in this case will help viewers process the incongruity.

Keywords: *Visual metaphor, visual structure, cognitive elaboration, verbal text.*

Introduction

The use of visual metaphor has witnessed a considerable increase which can be easily noticed in fieldslikepolitics, literature and advertisement. This extensive use led the topic to be a fruitful area of research for scholars. In fact, the main theoretical framework in studying visual metaphor remains Barthes'[2]work "La rhéthorique de l'image" which offers a theoretical framework towards understanding images and meanings in advertisements. In addition, visual metaphor has been tackled from different perspectives. Semioticians offered different systems of conveying meanings from images [3]; Kress and Van Leeuwen[4]; Chandler, [5]. Pragmatist researchers developed typologies of multimodal interpretation of visual metaphor [6]; [7]; [8]; [9]. Cognitive researchers investigated the way metaphors can structure and shape one's thoughts [10]; [11], the processing strategies of metaphors [12]; [13] and what are the main factors that contribute to the interpretation of metaphor [14]; [15].

As far as this study is concerned, the main framework used is Cognitive linguistics. It attempts to understand how the viewer processes visual metaphor; more specifically visual structure of visual metaphor. The background assumption is that language is not perceived as an autonomous system according to cognitive linguists [16]. Meaning is created through conceptualization, interaction with the world and experience rather than reflecting an objective truth and being limited to the word property. In the same context, Lakoff [17] adds that the creation of meaning leads to the concept of categorization which is a key concept in cognitive linguistics. He states that "categorization is not a matter to be taken lightly". There is nothing more basic than categorization to our thought, perception, action and speech". Henceforth, categorization is essential to any understanding of how our mind functions and thinks. In visual metaphor theory, the concept of categorization refers to the classification of visual metaphors into distinct types based on the way pictorial elements are placed and connected. In fact, there are three main categorizations which offer a theoretical background concerning the classification of visual rhetorical figures [18]; Forceville, [19]and [1].This research usesPhillips and Mc Quarrie's [1] typology which offers an accurate classification of visual metaphors. In what follows a literature review of Phillips and Mc Quarrie's [1] categorization and the impact of its visual structure on the viewer's cognitive elaboration.

Literature Review

Visual structure in visual metaphor

Visual metaphor is defined as "a rhetorical figure that occurs when an expression deviates from expectation, the expression is not rejected as nonsensical or faulty, the deviation occurs at the level of form rather than content, and the deviation conforms to a template that is invariant across a variety of contents and contexts"[1].More importantly, visual metaphor has been classified into nine types based on two dimensions; visual structure and meaning operation. The former refers to the manner the relevant pictorial elements are shown visually with an increasing degree of complexity. It offers three types of visual structure; juxtaposition, fusion and replacement. The second dimension, meaning operation, refers to "the nature of the relation between the two objects in comparison and to the required cognitive processing in understanding the picture" [1]. It distinguishes three values: connection, similarity and comparison. In what follows, a table describing the two dimensions followed by a sample of advertisements illustrating the different types of visual metaphor based on Phillips and Mc Quarrie's [1] typology.

Table1: Types of Visual structure in Phillips and Mc Quarrie [1]'s typology

COMPLEXITY	Visual Structure	RICHNESS Meaning Operation		
		Connection ('A is associated with B')	Comparison Similarity ('A is like B')	Opposition ('A is *not* like B')
	Juxtaposition (Two side-by-side images)	Equal sweetener	Dexter shoes	Comfort fabric softener
	Fusion (Two combined images)	Discover card	Tide Reflex racquet	Kudos granola bar
	Replacement (Image present points to an absent image)	Silk soy milk	Welch's juice	Canadian magazine industry Sunny Delight

Note. Typology of visual rhetoric showing classification of ad examples. Reprinted from " Beyond visual metaphor: A new typology of visual rhetoric in advertising." by B.J. Philips and E. F. Mc Quarrie, [1], Marketing Theory, 4 , 116.

Juxtaposition (Two side-by-side images)

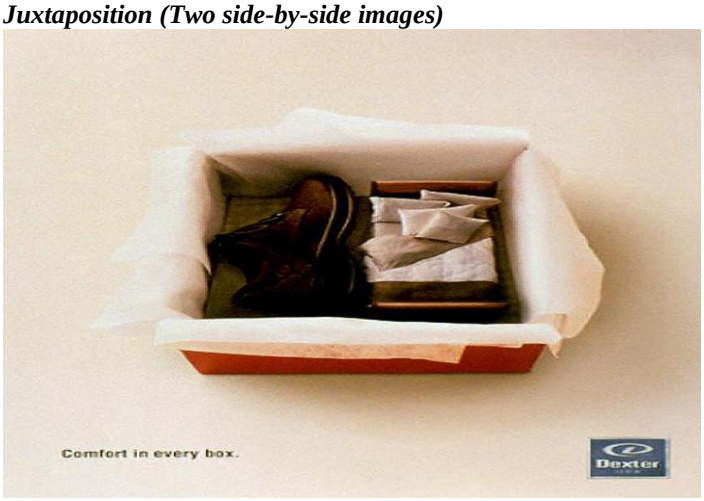

Figure 1. Dexter Shoe advertisement . Adapted from"Beyond visual metaphor: A new typology of visual rhetoric in advertising." by B.J. Philips and E. F. Mc Quarrie, [1], *Marketing Theory, 4* , 113–136.

Dexter shoes' advertisement shows two images(side-by-side): a bed and a pair of Dexter shoe. Indeed, the viewers of this advertisement are asked to compare the two images and reveal the similarities between them. Both the bed and the shoe are presented as having the same size but pictured separately. Henceforth, the visual structure in this advertisement uses a visual structure of juxtaposition because the two images are pictured side by side. Even though, the two images do not share any surface features, viewers can still easily see the structural similarities between the two elements. That is to say, the shoe is as comfortable as a bed. In addition, the viewers can reveal other interpretations such as the shoe is warm, relaxing, casual and cushioned[1].

Fusion (two combined images)

Figure 2. Kudos advertisement. Adapted from"Beyond visual metaphor: A new typology of visual rhetoric in advertising." by B.J. Philips and E. F. Mc Quarrie, [1], *Marketing Theory, 4* , 125.

Kudos, which is one of Mars' brands, uses an advertisement that includes a visual structure of fusion. It shows two fused images; one that refers to a malevolent stepmother and another image that reflects a good and tender mother. Such a use of visual structure invites the viewers to interpret the message as follows: "mothers will be perceived as nice and fairy godmothers, not wicked stepmothers, if they provide a good-lasting, yet still nutritious, snack for their children" [1].

Replacement (the present image points out to the absent image)

Figure 3. Soy milk advertisement. Adapted from "Beyond visual metaphor: A new typology of visual rhetoric in advertising." by B.J. Philips and E. F. Mc Quarrie, [1], *Marketing Theory, 4* , p.122.

The advertisement of Soy milk illustrates a visual structure of replacement where the present image refers to the absent image. The advertisement shows a form of a smiling face (the present image) that reflects the happy consumer of soy milk product (the absent image). Put in a different way, the smiling face is a replacement and a reflection of a whole entity which is the consumer. Moreover, the soy milk is connected to an enjoyable eating moment.

Despite its accuracy, the typology of Phillips and Mc Quarrie [1] has not been employed in previous studies to investigate the impact of the type of visual structure on the viewer's cognitive elaboration. Indeed, most researchers have devoted more attention to verbal metaphors than visual metaphors [20]. In this respect, Yannopoulou [21] states that studies focusing on the impact of visual elements on viewers have been an exception rather than a rule. Indeed, visual

structure is still marginalized in the research area. There is stilla lack of consumer or marketing theory available for distinguishing and organizing the different pictorial stratagems in advertising[22]. It seems reasonable, therefore, to hypothesize that cognitive process of visual metaphor depends upon the type of visual structure being used. In other words, it is assumed that a complex visual metaphor requires extra cognitive efforts. In what follows, a literature review on the impact of visual structure on the viewer's cognitive processing.

The impact of visual structure on the viewers' cognitive elaboration

Cognitive processing refers to the way people engage and enjoy challenging cognitive activities. It is also defined as "the extent to which the mind engages with the information it is asked to process" [23]; [24]. More importantly, contemporary researchers claim that the mental function is associated with cognition and they both form a complex network. The latter does not work without the presence of the environment, social connections, feelings and emotions [25].

In the context of advertisements, using metaphorical messages leads the viewers to better structure and organize the message information than literal language. This might be explained by the fact that metaphors are based on relational structure between the objects (A is B) and can lead to a more complex set of association in people's semantic memory[26]; [27]. The example"words are a sword" is a case in point. Indeed, viewers associate "sword" with concepts such as "sharpness" and "can hurt" which are connected to the "word" concept. More interestingly, studies focusing on cognitive processing show that those synthesis visuals provoke greater elaboration than juxtaposition visuals [28], [29]. It has also been confirmed that elaborating partially depicted objects in synthesis visuals requires greater cognitive elaboration than when the object is totally depicted[30]. In addition, the high complexity of synthesis visuals may increase the likelihood between the detection of the representational violation and the elaboration of the implicit meaning of visual metaphor [18].

Other studies found that processing visual metaphor differs from one country to another [31]. As a matter of fact, print cultures tend to process more visual than oral culture metaphor. Americans with an Asian background are less able to process visual tropes than Native Americans. Besides, it has been shown that persuasion will be more successful when the advertisement is more complex [32]; [29]. In fact, deviation and complexity have a positive effect as they both increase demands on processing. Henceforth, more complex schemes or tropes are more readily processed in the memory than less complex and effortful commercials [33]. Moreover, more complex and deviated figures engender better memorability than less complex messages. Furthermore, some researchers have hypothesized that pictorial metaphor occurs at the cognitive level, whereas verbal metaphor at the surface level of representation [34]. Besides, in case the modality of presentation of the metaphor is irrelevant there will be no difference in how consumers process an indirect metaphorical claim presented in pictures versus words and that processing indirect claims depends on the degree of consumers' involvement with the ad messages [35]. Only highly involved consumers will give interest in generating inferences from different indirect claims.

On the other hand, it has been found that people show different levels of need for cognition (NFC). Such difference can predict people's information-seeking behavior. Indeed, people who possess high NFC score usually enjoy challenging activities without the need of external motivational factors. People with low NFC score, however, prefer simple cues and engage in challenging cognitive activities only when there is a high need to do so [36]. Furthermore, Phillips and Mc Quarrie [1] point out that "an increase in complexity can be expected to produce greater elaboration as part of comprehension effort because complexity, within limits, is pleasurably arousing.

In the same context, Heckler and Childers [28] point out that rhetorical figures are deviations from expectation and they are therefore complex in nature and need extra cognitive elaboration to be understood. In other words, rhetorical figures are like puzzles and the viewer of the advertisement needs to put the different pieces together in their right place in order to get the intended meaning. Furthermore, Phillips and Mc Quarrie [35] state that more complex rhetorical figures will require more elaboration. In fact, juxtaposition structure requires the least processing effort because the two pictorial elements in the commercial are clearly separated. Fusion structure, however, is more complex because the two elements are merged together and consumers will require extra processing effort.

As far as the visual structure of replacement is concerned, this type requires the highest level of processing effort. In fact, Phillips and Mc Quarrie's [35]"claims do not agree with Madupu's [37] findings which show that ads with juxtaposition lead to more cognitive elaboration than fusion or replacement. Such a result may be explained by the fact that juxtaposition involves two separated elements, and viewers need to establish a connection between them in order to understand the ads. This connection requires extra cognitive processing demands as the number of different characteristics in the two pictures might increase. Fusion, however, requires less processing effort as it is a combination of images which are easy to connect and identify. In replacement where one element is missing, the advertiser usually places some clues to help the reader identify the missing element. These clues are supposed to reduce the demands on cognitive processing. Another explanation of why juxtaposition requires more cognitive processing is attributed to design complexity [38]. According to the above claims, the first hypothesis assumes that:

- **H0: An advertisement containing a complex visual structure does not require more cognitive elaboration.**
- **H1: An advertisement containing a complex visual structure requires more cognitive elaboration.**

The role of verbal text in the cognitive elaboration process of visual metaphors

Barthes [39] and Phillips [40] define verbal anchoring as the degree in which the verbal message helps interprets the visual message and vice versa. Studying the effect of verbal anchoring in advertisement has been absent in the literature. In fact, verbal metaphor is not well investigated as a stimulus in the research field of rhetorical figures [41], [35]. This may be explained by the fact that visuals and pictorial elements have become more popular in today's advertisement. Indeed, by using visuals in commercials, advertisers have moved from just telling the reader the meaning of the advertisement to leaving the interpretation open to every reader who perceive visuals as pictures to see rather than documents to read [1].

Regarding the impact of verbal text on the viewer's cognitive elaboration, this relation has been investigated through a direct cause effect relationship. Mc Quarrie and Phillips [35], for instance, have studied the effect of verbal anchoring on visual metaphors in terms of drawing multiple positive inferences. Their findings show that the introduction of verbal anchoring decreases the number of positive inferences. Henceforth, an advertisement without verbal anchoring is more effective. Furthermore, it has been shown that tropes, which are perceived as more complex, are preferred to less complex rhetorical devices namely schemes [42].

However, Mortimer [43] claims that the presence of verbal anchoring helps the reader interpret visual metaphor and draw the intended message. In addition, their finding shows that verbal anchoring reduces the number of inferences as the reader will adopt one interpretation. Chandlers [44] shows a distinction between the ways verbal structure is processed compared to visual structure. Their study has come up with a 22-item scale that differentiates the styles of processing verbal and visual content. Indeed, the difference between the way verbal claims are processed compared to visual claims is due to the fact that the visual system in the brain functions differently when compared to the verbal system [45]. Moreover, processing visual information does not transmit messages in the same way as verbal information because it processes information in an experiential way rather than in a linear way [35]; [46]. Furthermore, Petty et al. [47] developed the Elaboration Likelihood Model, which is a verbal-based theory of persuasion that helps understand how verbal messages are processed. Actually, the model shows that persuasive verbal claims are processed at a deeper level unlike visual content.

As far as the introduction of verbal texts in advertisement is concerned, the interaction between the image-text in visual genre has been subject to several studies. Barthes [2] is considered among the first researchers who focused on the role of text in helping grasp the meaning of visual metaphors and fix the visual meaning. His study reveals two types of image-text interactions. The first type is known as "relay" which means that the function of a text is to extend the meaning of the image or vice versa. The second type of relationship is "elaboration" which means that the text elaborates the image or vice versa. More importantly, Barthes [2] distinguished two types of elaboration. The first of which is when "the image is an illustration of text and the second type is when the text is a more definite and precise restatement of the image" [48].

A different point of view has been stated by Kress and van Leewen [4] who point out that an image is a separate organized message related to the text but independently. In other words, "text and image are two media of representation that express the same kinds of meanings in various forms"[48]. Furthermore, Forceville [34] focused on the interaction between the image and the text in advertisements using a cognitive linguistic framework. His work uses the concept of verbo-pictorial metaphor which refers to a metaphor always encoded visually and additionally to verbal form[48]. Moreover, studying the interaction effect of text has revealed four types of visual metaphor that differ according to the degree of metaphor city of the image. These types are presented below [48]

a) Pure visual metaphors profiled by the image. A verbal element is absent, so that the image carries the meaning and triggers a metaphor.
b) Visual metaphors triggered by the image and supported by the text. The source and the target are visually represented.
c) Visual metaphors reflected pictorially and verbally. The source and target are visually or differently rendered.
d) Visual metaphors activated by the text.

Another major finding in Alousque's [48] study concerns the different roles that a text plays in interpreting visual metaphors. The first role consists in a text which can act as a linguistic support of a metaphor encoded by the image. The second role refers to a text which combines with the image in order to interpret a visual metaphor. Last but not least, a text that reveals the metaphorical meaning of the image. Following this reasoning, there are different degrees of metaphor city of the image according to its connection to the text. A second major finding consists in the pragmatic role of the text. The latter can play a persuasive role by highlighting the product quality or one of its good features in order to persuade the viewer[48].

The above literature shows that there is a significant lack in terms of testing the verbal text as treatment effect. That is why; this research will attempt to test the impact of verbal text on the relation between the type of visual structure and the reader's cognitive elaboration by assuming the second hypothesis.

- **H0: A verbal text does not have an impact on the relation between cognitive processing and the type of visual structure.**
- **H1: A verbal text has an impact on the relation between cognitive processing and the type of visual structure.**

Methodology

The corpus

To test the two hypotheses, a sample of advertisements containing visual metaphors was required. The selection of the advertisements followed certain guidelines. In fact, nine print advertisements containing visual metaphor are selected. Each advertisement contains one type of visual structure according to the typology of Phillips and Mc Quarrie [1] and without including any verbal text except the brand name. Then, the same advertisements with the same visual structure accompanied

with a verbal text have been used in order to test the impact of the verbal content.

Procedure

This study used one dependent variable which is cognitive elaboration. It is defined as the extent to which information in working memory is integrated with prior knowledge structures. Broadly speaking, elaboration indicates the amount of complexity, or range of cognitive activity occasioned by a stimulus [49]. More interestingly, this variable takes two forms, namely, discursive and imagistic [31]; [40]; Madupu et al.[50]; [18]. The former was measured using three items on a seven-point semantic differential scale "I had few thoughts in response vs. I had many thoughts in response"; "The ad has one meaning vs. the ad has multiple meanings", "The ad has a simple meaning vs. the ad has rich". The second dimension, imagistic form was measured using three items on a seven-point semantic differential scale based on the study of Unnava and Burnkrant [51]. These items are "does not provoke imagery vs. provokes", "dull vs. vivid", "Boring vs. Interesting". As far as the independent variables are concerned, this research employed two variables, namely; the type of visual structure which includes three types; juxtaposition, fusion and replacement and the second independent variable is verbal text which consists in adding a text (the brand slogan) in each ads.

Sampling and data collection

Students of English represent the main target in this research. The selection followed a convenience sampling. A total of 170 questionnaires were distributed to the students of English at the faculty of Letters and Humanities of Sfax. However, a total of 158 questionnaires were retained because 12 questionnaires were rejected due to non-response.

Data analysis and Findings

The first analytical tool being used in this study was a factor analysis for the dependent variables. The KMO and reliability coefficient for the two dimensions of cognitive processing, imagistic form and discursive form, were satisfactory and equal to 0.72/ α=0.862 and 0.75/0.940, respectively. A mean-difference test (ANOVA) was used as a next step to test the null hypothesis that all the means between the categories of the independent variable, type of visual structure, are equal. In other words, the type of visual structure does not have an effect on the viewer's cognitive processing. In what follows, the mean difference and the Anova F-test are presented.

Table 2: Means difference for cognitive processing (imagistic form)

	Meaning operation		
	Connection	Similarity	Opposition
	Juxtaposition	Juxtaposition	Juxtaposition
M=0.936	M= 1.182	M= -1.114	
Fusion	Fusion	Fusion	
M=0.622	M= 0.343	M= -1.138	
	Replacement	Replacement	Replacement
	M=0.179	M= -0.359	M= -0.985

Table 3: F-test for cognitive processing (imagistic form)

Variable	Mean square	F	sig
Imagistic form	134.612	528.811	.000

According to table 2, the highest mean is shown for the visual structure of juxtaposition (1.182). Fusion shows the lowest mean (M= -1.138). Therefore, juxtaposition requires less cognitive effort to be processed unlike fusion which requires more cognitive effort to be processed. Table 3 shows a significant F-test (p=0.000<0.05). Indeed, the first null hypothesis (H0) is rejected as there is a difference between the groups of the types of visual structure and the way they are elaborated.

Table 4: Mean difference for cognitive processing (discursive form)

	Meaning operation	
Connection Similarity	Opposition	
Juxtaposition	Juxtaposition	Juxtaposition
M=0.958 M= 1.117	M=-1.030	
Fusion	Fusion	Fusion
M=0.756	M= 0.379 M= -1.044	
Replacement	Replacement	Replacement
M=0.179	M= -0.147	M=-1.094

Table5: F-test for cognitive processing (discursive form)

Variable	Mean square	F	sig
Discursive form	127.304	446.836	.000

Table 4 shows that juxtaposition records the highest mean (1.117). The visual structure of replacement, however, records the lowest mean (-1.094). According to these results, juxtaposition is the type of visual structure that requires the least cognitive effort while replacement requires the highest cognitive effort. More importantly, the F-test (table 5) shows significant result as p= 0.000<0.005. In order to test the viewer's cognitive processing of visual structure with the presence of verbal text (Hypothesis 2); a slogan was introduced in each advertisement in the questionnaire. In fact, the variable verbal text (slogan) is considered a mediator variable between the independent variable; the type of visual structure, and the dependent variable cognitive processing. According to the results above, the types of visual structure have an effect on the viewer's cognitive processing. Indeed, a complex visual structure requires more cognitive effort. Therefore, the first null hypothesis is rejected.

Table 6: Mean difference for cognitive processing after the introduction of verbal text (imagistic form)

	Meaning operation	
Connection	Similarity	Opposition
Juxtaposition	Juxtaposition	Juxtaposition
M=0.587	M= 1.890	M= 0.934
Fusion	Fusion	Fusion
M=0.200	M= -0.049	M= 0.013
Replacement	Replacement	Replacement
M=0.0991	M= 0.186	M= 0.173

Table7: F-test for cognitive processing (imagistic form)

Variable	Mean square	F	sig
Imagistic form98.035	217.559	.000	

According to table 6, the visual metaphor of juxtaposition records the highest mean (1.89). Fusion, however, shows the lowest mean (-0.049). In addition, table7 shows that the F-test is significant as p=0.000<0.05 (threshold of the significance level). Henceforth, the means between the groups are different. However, the introduction of verbal text does not modify the cognitive processing for the first dimension imagistic form. In other words, juxtaposition records the highest mean before and after the introduction of verbal text, while fusion records the lowest mean before and after the introduction of the verbal text.

Table 8: Mean difference for cognitive processing after the introduction of verbal text (discursive form)

	Meaning operation	
Connection	similarity	opposition
Juxtaposition M=0.569	Juxtaposition M=0.749	Juxtaposition M=1.808
Fusion M=0.335	Fusion M=0.045	Fusion M=0.063
Replacement M=0.025	Replacement M=-0.054	Replacement M=0.164

Table9: F-test for cognitive processing (discursive form)

Variable	Mean square	F	sig
Discursive form85.021	162.163	.000	

Table 8 shows that juxtaposition records the highest mean (M= 1.808) while replacement records the lowest mean with -0.054. More importantly, table 9 shows that the F test is significant (p<0.05). Henceforth, with the presence of verbal text juxtaposition and fusion require less cognitive processing while replacement needs more cognitive effort. This finding is similar with the previous result that shows that juxtaposition is the easiest visual structure to process and replacement is the most difficult. However, the means before the introduction of verbal text are different from the means after the introduction of verbal text.Indeed, both juxtaposition and replacement accompanied with a verbal text recorded a higher mean. This finding led to the rejection of the second null hypothesis that claims that verbal text does not have an effect on the relation between cognitive elaboration and type of visual structure.

Discussion

The Anova tests regarding the effect of the visual structure on the two dimensions imagistic and discursive from of the dependent variable, cognitive elaboration, are significant (Table3 and5). The significance of the F-test means that there is a difference inthe cognitive processing of the different types of visual structure (without verbal text). In fact, this difference varies according to the complexity of visual structure.A more complex visual structure requires extra cognitive elaboration. More importantly, findings in tables2 and 4 show that juxtaposition records the highest mean followed by fusion and replacement. Henceforth, juxtaposition requires less cognitive effort from the viewer than fusion or replacement. Such result might be explained by the fact that juxtaposition is more appealing thanks to its low incongruity level. This result agrees with Phillips and Mc Quarrie's [35] finding which shows that more complex rhetorical figures require more elaboration. In fact, juxtaposition structure requires the least processing effort because the two pictorial elements in the commercial are placed side-by-side. Fusion structure, however, is more complex than juxtaposition because the two elements are merged together and readers require extra processing effort. This result also goes hand in hand with the finding of Gkiouzepas and Hogg [18] who claim that synthesis visual structure (fusion) is cognitively more demanding than juxtaposition. Furthermore, Meyers-Levy et al. [52] find that elaborating partially depicted objects in synthesis visuals requires greater cognitive elaboration than when the object is totally depicted. In addition, the high complexity of synthesis visuals may increase the likelihood between the detection of the representational violation and the elaboration of the implicit meaning of visual metaphor.

This first finding, however, disagrees with Madupu's [37] finding which shows that juxtaposition leads to more cognitive effort than fusion or replacement. Such a result finds its legitimacy in the fact that juxtaposition involves two different elements, and consumers need to establish a connection between them in order to understand the ads. This connection requires extra cognitive processing demands as the number of the different characteristics in the two pictures might increase. Fusion, however, requires less processing effort as it is a combination of images which are easy to connect and identify. In replacement, where one element is missing, the advertiser usually places some clues to help the reader identify the missing element. These clues are supposed to reduce the demands for cognitive processing. Another explanation of why juxtaposition requires more cognitive processing is attributed to design complexity [38] .In other words, the complexity of visual structure is not only how the two visuals are presented as suggested by Phillips and Mc Quarrie 's [1] typology, but also the design and feature complexity are key factors that impact on cognitive elaboration of the visual structure.In addition, Lowrey [53] states that motivation to process advertisement is reduced when extra effort is required which contradicts the findings of Phillips and Mc Quarrie [35].

As far as the introduction of verbal text is concerned, the result shows that juxtaposition requires lower cognitive effort than without a verbal text. In fact, juxtaposition becomes easier to process with a verbal text because it helps the viewers solve very quickly the incongruity. More importantly, the presence of verbal text has a significant impact on the most complex visual structures; namely, fusion and replacement. Indeed, viewers will not opt out from the processing difficult visual structures when they are accompanied with a verbal text that helps the viewer's solve and enjoy spending extra cognitive effort.

Conclusion

Visual rhetoric is set within the framework of rhetorical theory which dates back to ancient time, and has been studied in different fields such as cognitive science, semiotics, linguistics, pragmatics and relevance theory. It is

considered as one of the most persuasive tools, especially when it comes to the advertising area. More importantly, studies focusing on visual rhetoric have come up with three main typologies of the different types of visual rhetoric, namely; Foreceville's [34] typology, Phillips and Mc Quarrie's [1] typology and Gkiouzepas and Hogg's [18]typology. This piece of study used Phillips and Mc Quarrie's [1] typology to examine the effect of the types of visual structure on the viewer's cognitive elaboration. By visual structure, Phillips and Mc Quarrie [1] refer to the way the two pictorial elements are presented visually with an increasing level of complexity which includes three concepts: juxtaposition, fusion and replacement.

The main results show that as visual structure increases so does cognitive elaboration and. Indeed, juxtaposition requires less cognitive elaboration and is easier to understand than fusion. Similarly, fusion is better understood and needs less cognitive effort than replacement. Such a result enhances the idea that the viewer is willing to spend efforts in solving incongruity and tries to understand it as long as it is not so complicated. In case, the advertisement contains too complex visual structure, the reader will just opt out and will not be willing to process or understand the advertiser's message. Another major result lies in the introduction of verbal text which resulted in a variation between visual structure and cognitive elaboration. The three types of visual structure are better processed and need less cognitive effort when a verbal text is presented. Such variation is more noticeable in replacement because viewers will enjoy solving its incongruity instead of opting out.

The main theoretical contribution of this study lies in its attempt to offer a clearer framework about visual metaphor in theory. It has also tried to understand the literature gap in terms of the effect of the type of visual structure on the reader's cognitive elaboration, and the impact of verbal text in strengthening or weakening this cognitive process.

As far as the practical contributions are concerned, this research helps practitioners in the area of advertising have an idea about the impact of the type of visual structure and verbal text on the viewers' cognitive elaboration. Indeed, using visual metaphor in advertisement is highly recommended as it is original and very appealing and has a persuasive effect on consumers. This use, however, should take into account that too much incongruity in visual structure will lead to negative outcomes. In fact, it is recommended for advertisers to use visual structure of juxtaposition and fusion where the presence of the two pictures helps the viewer solve the incongruity. The most complex visual structure, namely replacement should be used with a verbal text or any other clue that helps the reader solve and enjoy the incongruity.

Limitations to the study and Future research

Like any other research, this study does not escape from some limitations. First, this study targeted only the students of English which may limit the generalization of the results. Furthermore, the sample size is considered small. Therefore, it is recommended to enlarge the sample to be able to validate the results. It is recommended for future research to include moderator variables such as reader's involvement and motivation to be engaged in challenging activities.

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