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Application Study of Gestalt Visual Perceptual Laws in Advertising Billboard Graphic Design

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Abstract

Aim & Background: Gestalt theory is one of the most impressive theories in the field of visual arts that has focused on integrated vision of artwork and sketched specific visual laws of perception. On the other hand, due to the alignment of the goal of visual communication and lasting impression on the audience's minds, the application of these graphic design principles especially commercial billboards is essential. In recent years, we have been faced with impressive billboard designs in Tehran, which apparently have no other purpose except a profound impact on the audience's minds. In this regard, with the aim of studying the visual qualities and Gestalt visual laws of perception in Tehran's billboard graphic designs, it was evaluated the amount of Gestalt visual laws of perception in Tehran's commercial billboards' texts and graphical images in 2015-16. It was determined the most effective graphic design principles in billboard advertising and detected the relationship between Gestalt's laws and these principles that can be used in billboard graphic designs.

Methods: In order to analyze the case samples, descriptive-analytic method was used based on Gestalt's laws. The research method is a theory test that was performed on 150 samples of Tehran's commercial billboards in 2015-16. The data collection method was using written sources and scientific databases, analyzing and comparing the topics with Delphi method.

Results & Conclusion: The research findings indicated that each of the laws has been used to some extent in Tehran's commercial billboards' texts and graphic images in 2015-16. The most important of visual qualities and billboard graphic design principles have high reliability. Its Cronbach's Alpha is 0.796. According to visual identity, Gestalt's laws and the graphic design principle's definitions, all principles can be linked to a category of Gestalt's laws. There is an interactive communication between them. Each law can benefit some of the design principles and vice versa.

Keywords

Gestalt Visual laws of perceptions, Billboard Advertising, Graphic Design.

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Introduction

Billboard is one of the most impressive media in an advertising campaign which provides visual communication and lasting impact on the mind of the audience. In recent years there are many billboard designs in Tehran. According initial review of billboard's visual features, agencies and designers of environmental advertising often design the billboards without paying attention to the visual features. They don't pay attention to the design and composition based on visual perception of the audience. The Gestalt visual perception theory that expresses some laws to organize perception has been expanded by art theorists. The most important of them are used in the design and analyze of artwork. These laws are similarity (in shape, color, and size), proximity (by combining, overlap, touch, and close edge), continuity, closure, figure-ground, symmetry and inclusiveness (Wertheimer 1923: 308).

What attracted the artists in Gestalt theory were the findings and experiences that influenced the artist's creation in visual perception. This effect was somehow a fascination with the knowledge of how the audience was influenced by the artist, creating a tool for him to maze his audience. On the other hand, due to the alignment of the goal of visual communication and lasting effectiveness on audience's minds, the use of the laws in graphic design, especially commercial billboards, is indispensable!

In this regard, with the aim of studying the visual qualities Gestalt's laws in Tehran's billboard graphic designs, in the present study it was evaluated the amount of Gestalt visual laws of perception in Tehran's commercial billboards' texts and graphical images in 2015-16. It was determined the most effective graphic design principles in billboard advertising and detected the relationship between Gestalt's laws and these principles that can be used in billboard graphic designs.

In order to analyze the case samples, descriptive-analytic method was used based on Gestalt's laws. The research method is a theory test that was performed on 150 samples of Tehran's commercial

billboards in 2015-16. The data collection method was using written sources and scientific databases, analyzing and comparing the topics with Delphi method.

The results can show the importance of the audience's visual perception and Gestalt's visual laws of perception in graphic billboards' designs and their analysis. They are useful as guidance for graphic designers and educators, advertising companies, environmental advertising activists, urban beautification organizations too.

Literature review

The preliminary study about the design process dates back to the late 1950s and early 1960s in Europe. Research-based design in the early years was based on the belief that the essence of the design process is largely independent of its subject matter and, according to this belief, design in all fields has a similar process (Shahidi et al., 2008: 82). Graphic design is a visual communication that the relationship of message and audience or artist and audience is taken through the image. A designer combines visual images and elements and creates artworks that have a definite message. The billboard graphic designer should also be able to send the messages. The image and text can be perceived easily by audience's mind. They can be fully integrated in the strong Gestalt of composition and form. In 1923, Wertheimer in "Theory of Form" which became known as the "Treatise of the point" states that "various Gestalts based on our intrinsic desires to group or" associate "to see elements that are similar (Similarity grouping), closely related elements (adjacent groupings), or those with structural savings (good continuity). (Behrens 2004: 14). Therefore, the deliberate use of the Gestalt's laws provided by Wertheimer based on human visual perception can be considered as the basis for graphic design and billboards for organizing design based on audience's perception. In Iran, little research has been done on the application of Gestalt theory to graphics, examples of such studies can be found in some studies by students and

faculty of visual arts (graphic) in the field of study: Afshar Mohajer & Nemin Salimi (2009) in “The Use of the Gestalt Visual Cognition Theory in the Classroom Textbooks” describe the operation of each Gestalt’s laws of perception in the textbook. Ronald Luther proposes three principles for textbook layouts: figure-ground, ranking and Gestalt. He describes three types of grouping in the textbook based on proximity and similarity laws. According these types, ranking, parallel, and subordinate can effect layouts. Then, Williams’s design principles are explained proximity, alignment, repetition, and contradiction. Ramezani & Roshanfekar (2012) in “Why? How? Graphic Design with a Gestalt Approach” addresses the role of perceptual laws in graphic design (poster) teaching, and the connection

of visual techniques (dualities such as blur / Clarity and ...) and Gestalt’s theory. In the design of visual and text signs and poster design, there are also many examples of Gestalt’s perceptual laws that the artist is likely to unconsciously apply to the creation of his work of the seven Gestalt perceptual organizing laws (Table 1).

Moreover many studies have been conducted by researchers about the factors affecting billboards advertising by 2011 (Kelley & Jugeheimer 2004; Sissors & Baron 2002; Taylor et al. 2006; pp. 21-34; Taylor 1997, pp. 179- 186; Vanden et al. 1999; Woodside 1990, pp. 229-237; Bukhara’i 2009; Balkafel 2005; Aristoph 2009; Habibollah Khan 2016; Thomas 2015; Hussein & Nizamani 2011). The factors affecting the main elements of

Table 1. Background Studies on the factors affecting commercial billboards advertising. Source: authors.

The Factors Affecting Billboard advertisings		
The factors related to the color of billboard	The factors related to the billboard image	Factors related to billboard text message
Effective factors in recalling billboards		
<ul style="list-style-type: none"> • Billboards in black and white are remembered more than colored billboards (Dontaha et al.; 1993, p.69) 	<ul style="list-style-type: none"> • The positive impact of the image on the amount of advertising reminder (Bhargava et. al; 1994, p.54) 	<ul style="list-style-type: none"> • Less words, more reminders (Dontaha et al.; 1993, p.68) • Short message, the number of text words and place information (Bhargava et al. 1994,p. 53)
<ul style="list-style-type: none"> • Use of white space (Balkafel et al. 2005) • Using a limited number of colors (various colors lead to confusion) (Aristoph 2009, p. 91) • The effect of billboard’s color on attracting attention (Nizamani et al. 2011, p. 64) 	<ul style="list-style-type: none"> • The positive effect of exciting images (Balkafel et al. 2005) • Reducing the product identification time using the product image (Aristoph, 2009, p.90) • Role of the image in attracting the audience's attention (Nizamani et al. 2011, p.63) • Using surprising, thrilling, humorous and creative methods for more engagement of the audience with the sender of the message (Sedaghat, 2011, p. 35) 	<ul style="list-style-type: none"> • Readability of the text, the readability of the text depends on the language of the text. • The empty space between the letters and the size of sentences should be appropriate (Balkafel et al. 2005) • Message and Fonts: <ul style="list-style-type: none"> * Message: Information about company, product and creativity. * Fonts: Readability of Message, Brief Bordan of Message (Taylor et al. 2006, p. 30) • Readability of the text, the need for the audience's attempt to understand the message (Blasko et al. 1985) • Brand recognition (Aristoph, 2009, p. 88) • Simplicity of the message, less information, more attention (Resnik & Stern 1977, p. 51, 1991,p. 42) • Clarity and Short Text and Billboard Messages (Nizamani et al. 2011, p. 63) • The number of words and their size (Thomas 2015, p. 11)

commercial billboards (texts, image and color) are listed in table 1.

Regardless of the factors affecting billboards advertising and the importance of the audience's visual perception in advertising's visual presentation, according to the studies, the role of Gestalt visual laws of perceptions as a model in the billboard's image and text design, and its relation to graphic design principles have not been mentioned. Moreover due to the different way of paying attention to the visual perception process in the Gestalt Psychology School, many papers need to consider the conceptual system and its mode of action in design; Most of them, however, are a review of Gestalt theoretical foundations and are not concerned with billboard graphic design. This is a problem that can the graphic design especially billboards be analyzed by Gestalt theory to enhance its impact and does the theory use as a design method?

Theoretical Framework

Due to the broad concept of Gestalt, no direct translation of it has been made in any of the languages. This word in German means a form; in English, it is organized as it is, as if or formulated (Bruno 2007: 286). The word "Gestalt" is a German word and can't be found to be the correct equivalent in any other languages, therefore, it is also used in psychology books and textbooks. In Persian, it can be equated with concepts such as "shape", "template", "organ", "form" or "whole", "integrity", and "board"; but it should be added immediately that these words do not fully express the meaning of Gestalt (Shapourian 2007: 172). There are two meaning in Great German Brookhouse Dictionary: "the unified and systematic manifestation of an object which appears to be without regard to its details" and in another and more general sense: "The system of the intellectual, which is in the diversity of elements and form, is intended to the extent that the unity and structural law and its nature, for example, an organism-express mental, spiritual and psychological content - for example, an artwork." In the recent meaning, Gestalt

includes all stage of reality from the most concrete to subjective of them (1996: 780). Gestalt represents a method by which objects, "Gestalt", are inserted and put together. Kepes in "The language of the image" believes: "General Gestalt is a material, psychological or institutional, with coordinates which components are individually non-existent" (Kepes, 2003: 62). Gestalt theory examines the perceptual processes of the brain and points out that the principle of mind practice is holistic, parallel, and in association with self-organized tendencies (Gordon, 2004: 15). As Ehren Fels, and Wertheimer also proved it, in the sense that in the perception of a set or structure, the whole is received, not every single component. The main thesis in Gestalt theory is that "general motifs dominate over their constituent elements and possess properties which are not their elements. The whole is more than the sum of its constituents (Wertheimer 1938c: 72). There is a limit to the amount of information that the mind can track. When the amount of visual information is omitted, the mind seeks to simplify it by using the grouping. Therefore, the Gestalt's laws play an important role in helping the human mind; the most important of them in the analysis of artwork are the laws of similarity, proximity, continuity, integrity or closure, figure-ground relations, symmetry and inclusiveness (Dandis, 1992: 60).

- 'The Law of Proximity

This law states that objects that are located close to one another will be perceived as being associated with one another, i.e. as belonging to a group, or as parts of a larger whole (Wertheimer, 1938c: 72).

- 'The Law of Similarity

Objects which share similar properties are assumed to have association with one another. These similar properties may be, for example, visual properties such as shape or color (Ibid).

- 'The Law of Direction (or 'the law of continuity or 'good continuation')

When a line (or objects arranged in a way that indicates a line) is perceived, which appears to have one or more branches, the branch which follows the direction

of the original line most faithfully is perceived as being the continuation of the original path, and others are perceived as appendages (Ibid: 78).

- ‘The Law of Closure’

Objects that are close together are perceived as being part of a whole, to the extent that gaps between them may be imagined to be ‘closed’, forming complete shapes or borders. Wertheimer notes that in many cases this is not the dominant factor – Others may predominate (Ibid. 78 and Bruno: “Closure”, 2007: 295).

- ‘Figure and Ground’

It is a type of perceptual grouping which is a vital necessity for recognizing objects through vision. In Gestalt psychology it is known as identifying a figure from the background. This is the basic law of visual perception, which helps us to read a structured image. Reading an image is based on the contradiction between the figure and ground. Figure is the most recognizable and ground is seen second. The background is not always the same background, and in some cases, the recognition between the figure and ground does not look easy. The two identity forms are as follows. The figure and the ground constantly change their place because they have the same characteristics and features” (Wertheimer 1938c: 80). In this form of figures, figure and ground define each other. In other words, by drawing a figure, the ground is also drawn, hence the two are inseparable. This phenomenon is rooted in the ritual and very ancient symbol of Yin and Yang (Rezazadeh 2008: 36). But the most famous form of them is the identity of Rubin’s pot or Pythropol Rubin’s profile. “In Rubin’s pot, the positive and negative parts of figure are replaced with each other, and it depends on the pot or the two profiles that are facing each other. It is very difficult to determine which one is seen first. In fact, we can see both of them together. Hence, the relationship between figure and ground are so close .In general, it uses the illusion that can be shown in many ways in order to create unity, emphasis and attract attention of the audience (Dandis, 1992: 62)

- ‘The Law of Inclusiveness’

In a visual structure, the smaller gestalts are covered by larger gestalts. It means larger shape covers smaller shape and will be perceived earlier. This law implies that a visual structure in general may consist of several small gestalts, which are subsets of the larger gestalt (Wertheimer, 1938c: 81).

- ‘The Law of Symmetry’

Under the law of symmetry, the mind understands objects symmetrically and forms them around a central point. Perceptually, we tend to divide things into symmetric parts. Therefore, when two symmetric elements are not interconnected, they connect each other to create a coherent design (Dandis, 1992: 64).

- ‘The Law of Prägnanzstufen’ (also known as ‘The law of Prägnanz’, ‘law of good configuration’, ‘law of simplicity’ or ‘law of pregnancy’)

The simplest arrangement of elements is likely to be perceived first: When presented with a series of complex elements, we are likely to perceive them as being parts of a simpler whole²² (where ‘simple’ arrangements are those “having fewer rather than more elements, having symmetrical rather than asymmetrical compositions, and generally observing the other “Gestalt principles of perception”) (Kofka quoted from Hergenahan, 2003: 290).

Methodology

In the field of analyzing case samples, the descriptive-analytical and comparative method was used based on the theoretical foundations of Gestalt visual perception and Delphi method. The research method is a theory test that was studied in 150 samples of commercial billboards in Tehran during 2015-16. The method for collecting data includes the use of written sources and scientific databases. In 2015-16, there were 328 billboard. 80 billboards were empty. 50 billboards contained cultural advertisements (Sadeghi, 2015). 150 commercial billboards were randomized sampling in Tehran from March 2015 to January 2016, which are case studies in this research. These samples were taken photo of the licensed advertising archive in the Islamic Guidance Office of Tehran. This collection is divided into 14 categories

based on brand or product type: LG Products (11), Samsung and Sony (9), Hamrah-e-Aval (9), Banks and Banking Services (23), Food Products (32), Internet Service (5), Bags, Shoes and Apparel (7), rugs (9), health and beauty products (8), equipment and tools (12), car and parts factory (12), galleries and commercial complexes (2), festivals and exhibitions (7). The results of this content analysis are analyzed in Excel 2013 and SPSS 23 software (Fig. 1,2,3,4, 5,6,7,8).

In Fig. 1: 1. Law of similarity in color: red, white
2. Law of Similarity in shape: Internet Bank Mellat's

font, Logo Mellat Bank, Hour.

3. Law of proximity by the edge: Internet Bank of the Mellat, Hours, Wifi sign, Logo Mellat Bank, Mellat Bank of England

4. Continuity Law: Roman numeral Hours

5. Inclusiveness law: Clock, Internet Bank of the Nation.

1. Law of similarity in size: the same text size

2. Law of similarity in color: white, blue, black

3. Law of similarity in shape: SMS text font, sub scripts, phone numbers, in-box entries, original xpurchase



Fig.1: Billboard of the Mellat Bank, Gestalt laws in Texts, Photo: authors, 2015.



Fig.4: Billboard of Alfa Romeo. Gestalt laws in texts, Photo: authors, 2015.



Fig.2: Billboard of Isaquo, Gestalt laws in Texts, Photo: authors, 2015.



Fig.3: Billboard of Hamrah-e-Aval, Gestalt laws in texts, Photo: authors, 2015.



Fig.5: Billboard of Samsung TV. Gestalt laws in image, Photo: authors, 2015.



Fig. 6. Billboard of Novin Charm. Gestalt laws in image, Photo: authors, 2015.



Fig.7: Billboard of Top. Gestalt laws in image, Photo: authors, 2015.



Fig.8. Billboard of Adidas Shoes. Gestalt laws in image, Photo: authors, 2015.

- 4. Proximity law by edge: Buy the original, phone + original
- 5. Closure law: ASL
- 6. Inclusiveness law: ASL

In Fig. 3:

- 1. Figure-ground law: Labbeyk (Figure) and orange-blue (Ground), orange-blue (Figure) and Labbeyk (background).
- 2. Law of Similarity in size: Labbeyk's Font, Labbeyk in th Background, Eid-e- Saeid Ghorban Mobarak, Hamrah-e-Aval, the address of the site.
- 3. Law of Similarity in color: White, gray.
- 4. Law of Similarity in shape: Labbeyk, Labbeyk

in th Background, Eid-e- Saeid Ghorban Mobarak, logo of Hamrah-e-Aval.

- 5. Law of Proximity by edge: Labbeyk, Eid-e- Saeid Ghorban Mobarak.
- 6. Continuity law: Labbeyk (rhythm of “ک” letter), prayer text of background (rhythm of text).
- 7. Closure law: Labbeyk
- 8. Inclusiveness law: Labbeyk, prayer text of background.

In Fig. 4:

- 1. Law of Similarity in size: Alfa Romeo's font, font of English slogan, font of Persian slogan.
- 2. Law of Similarity in color: white, yellow.
- 3. Law of Similarity in shape: Alfa Romeo's font, font of English slogan, font of Persian slogan
- 4. Inclusiveness law: logo of Alfa Romeo, Sign of Alfa Romeo.

In Fig. 5:

- 1. Law of Similarity in color: gray contrast
- 2. Closure law: TV (LED) incomplete.

In Fig. 6:

- 1. Inclusiveness law: Bahram Radan picture.
- 2. Figure-ground law: Hart (Figure) and Shirt (Ground), Shirt (Figure) and Hart (Ground).
- 3. Law of Proximity by Touch: hart-shirt.
- 4. Law of Proximity by Combining: hart-shirt.
- 5. Inclusiveness law: Shirt.

In Fig. 7:

- 1. Law of Similarity in size: the 3 shoes, 3 frame.
- 2. Law of Similarity in shape: 3 square frames.
- 3. Law of Proximity by Touch: 3 frames, 3 shoes.
- 4. Continuity law: 3 frames, 3 shoes.
- 5. Symmetry law: the shoes in 3 frames.
- 6. Inclusiveness law: the shoes.

Gestalt's laws in Billboard's Texts and Images

In this section, each Gestalt's laws of perception is analyzed in the image and text of each billboard to determine how these laws are applied in design, and the number of each law in billboard's image and text. In figures (1-4), the presence of Gestalt's laws in text and image designs (5-10) is shown in the figures. Based on the definitions of the laws, as in fig.2, the



Fig. 9. Billboard of Saypa. Gestalt laws in image, Photo: authors, 2015.



Fig.10: Billboard of DG Kala. Gestalt laws in image, Photo: authors, 2015.

word “اصل” is combined with the bar code mark (proximity by combining) and the distance between the “اص” and “ل”, the mind invites the reader to complete its reading (closure). In the fig.1, the colors are red and white in each separate letter following the “similarity in color”, the size of the fonts, such as the “similarity in size”, and the Roman numerals are the “Continuity Law”. In fig.9, the combination of figure with the orange background “figure and ground”, as well as the recognition of the soccer player’s “closure”, and the domination of the figure and the orange background in the whole space, are “inclusiveness law” (Fig. 9,10).

In Fig. 9: 1. Figure-ground law: figure (Figure) and Orange background (Ground), Orange background (Figure) and figure (Ground).

2. Law of Similarity in color: orange, red, yellow.
3. Law of Proximity by Touch: figure, background, white, orange.
4. Law of Proximity by Combining: figure and

orange background.

5. Closure law: figure.

6. Inclusiveness law: figure and orange background.

In Fig. 10:

1. Law of Similarity in size: the eggs.
2. Law of Similarity in color: white color of pictogram.
3. Law of Similarity in shape: the eggs.
4. Continuity law: the eggs.
5. Closure law: product’s pictograms.
6. Inclusiveness law: the eggs.

These are some examples of 150 billboards. Each of them was analyzed based on counting the number of Gestalt’s laws in their images and texts.

Results

Using the analyses done on each billboard and counting the laws in images and texts of all 150 billboards, the percentage of Gestalt’s laws in billboards was calculated. Figures 11 and 12 show Gestalt’s laws in them, according to the amount of each law in the images and texts of Tehran’s 150 Billboard samples in 2015-16.

The findings based on frequencies show that similarity in size, shape, color, inclusiveness, proximity by close edge, continuity, proximity by overlap, touch, figure-ground, symmetry, proximity by combining and closure have extensive use respectively in the billboard’s texts. Proximity by touch, continuity, proximity by combining, inclusiveness, similarity in color, shape, proximity by overlap, similarity in size, proximity by close edge, closure, and symmetry, figure-ground are common in the billboard’s images too.

Principles of Billboard graphic design

In the context of graphic design principles, from art theorists’ view, Dandis presents the Visual Literacy Principles and Qualities in his Visual Literacy Book (1931), which is the basis of any visual art creation. These principles include the

Fig.11: Frequency Percentage of Each Law in the text’s 150 Billboard Samples. Source: Authors, 2015-16.

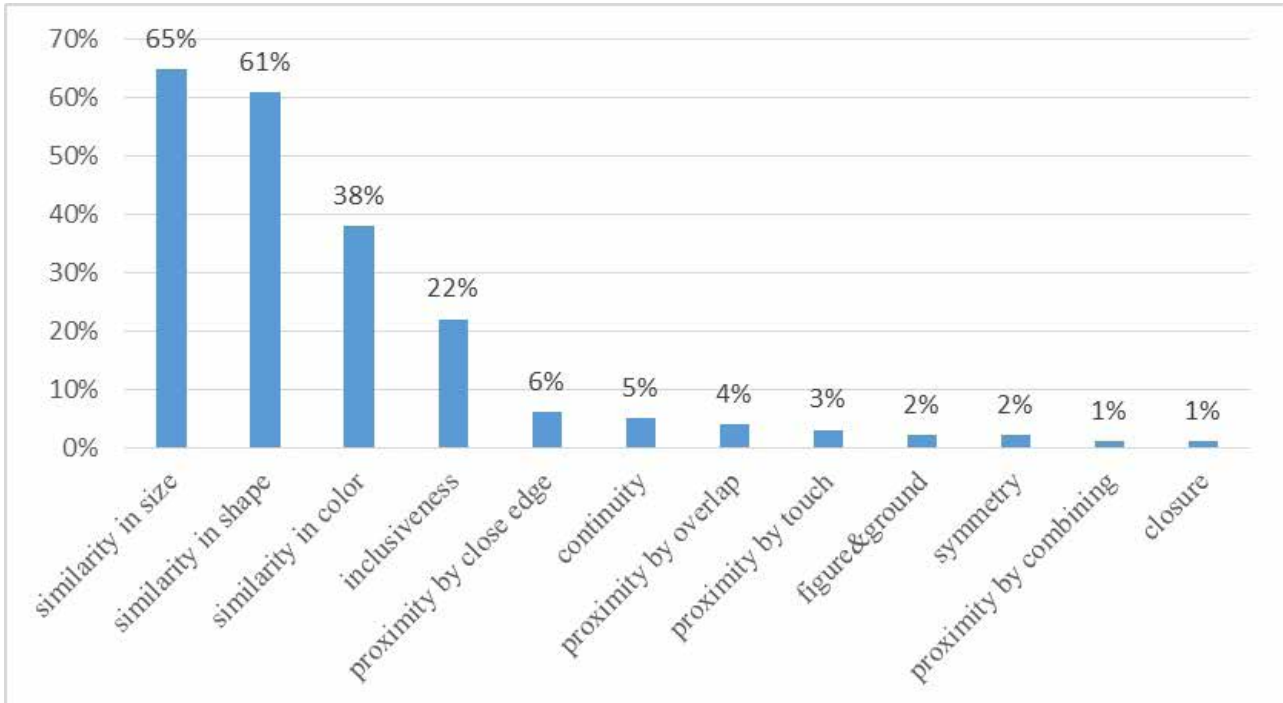
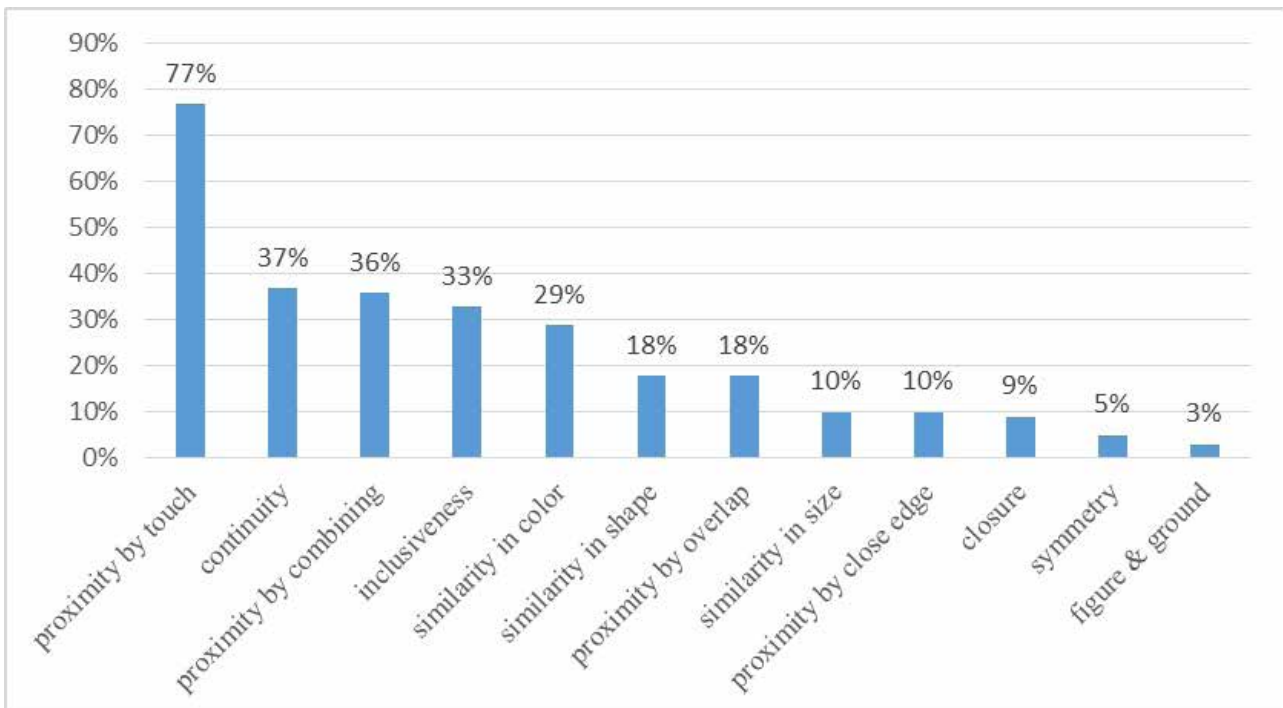


Fig.12: Frequency Percentage of Each Law in the image’s 150 Billboard Samples. Source: authors, 2015-16.



opposite duality, such as balanced-unstable, symmetric-asymmetrical, regular-irregular, simple-complex, unity-dispersion, cost-effective/snatch, concise/exaggeration, predictive ability/no predictive, Flat/three-dimensional, mono-element /multi-element, trudging-tangled, clarity-fade, repeat-loose link, contrast in color, shape, size and direction, negative space, aligned and rhythm, that is used in poster design. To find the principles that can be effective in billboard graphic design, these dual principles were discussed by the Delphi method to reach consensus, among 20 Isfahan Art University's graphic teachers and 10 Tehran billboard's designers. After collecting experts' votes, and applying statistical calculations (binomial test and exploratory factor analysis), some of them were eliminated in SPSS23 software, and symmetry, regularity, simplicity, unity, cost effective, concise, emphasis, transparency, uniformity, mono-element, clarity, repeat, sequence, negative space, balanced, with high significance level (sig:0), generalizable to the statistical society (150 billboard samples), and with its internal correlation coefficient, Cronbach's Alpha 0.795 has a high degree of reliability for billboard graphic design . After this step, the approved principles, in the form of a checklist with a Likert scale (1-5 points - very little to very high), for all 150 billboard's images and texts were provided and placed to 10 billboard graphic designers with over 5 years of work experience. The frequency percentage of each image and text's design principles were calculated in all 150 billboards that have been shown respectively in Figures 13 & 14.

Figs. 13&14 show the frequency percentage of graphic design principles in the 150 billboards from point of view of designers. Arrangement of the image's design from the highest to the least frequent; regularity, balanced, transparency, simplicity, clarity, sequence, mono-element, uniformity, cost effective, concise, negative space, symmetry, unity, emphasis, repeat and in

texts clarity, transparency, simplicity, uniformity, mono-element, sequence, unity, negative space, emphasis, repeat, balanced, symmetry, regularity, cost effective, concise.

Comparison and analysis of visual perception Gestalt's laws and graphic design principles

Images and texts have very important role to convey the messages quickly in billboard's graphic design. Gestalt perceptual organizing laws play a major role in the audience's visual perception. Human mind automatically tends to group phenomena for a quicker and more accurate understanding of message, and it has been proven that Gestalt perceptual laws facilitate messaging. On the other hand, the perception of billboard's images and texts should take place quickly; so graphic design can use Gestalt theory to do it. One research's objective is the comparison and discovery of the relationship between Gestalt's laws and the graphic design principles of billboard's images and texts. It was done by descriptive-analytic method and using design principles and Gestalt perceptual laws. Because of the research subject's novelty we couldn't discuss the results with other studies.

The findings of the two previous steps can be compared and analyzed: According to visual identity, Gestalt's laws and the graphic design principle's definitions, it is likely that each design principles can be defined in a group of Gestalt's laws. So for categorizing and comparing two items by using Delphi method, the findings were discussed among 20 faculty members and 10 designers who were first surveyed to confirm the graphic design principles:

Delphi method results show that all design principles can be subset of Gestalt's laws like the symmetric principle of design subset of symmetry law, the sequence and repetition subset of continuity law, concise and cost effective subset of closure law, balanced and regularity subset of the proximity (by close edge, touch, combining, and overlap) law, uniformity (color, shape and size) subset of similarity laws (shape, size and color) and mono-element

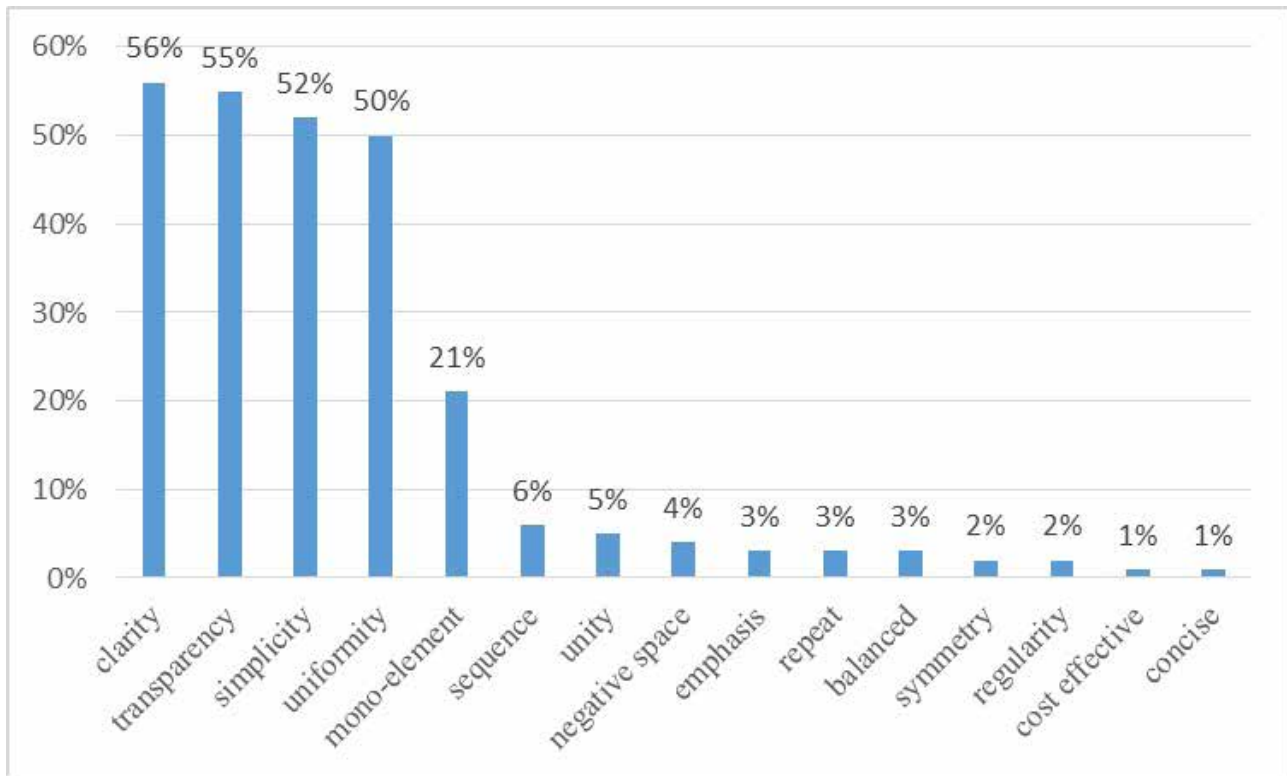


Fig. 13. Frequency of Graphic Design Principles in 150 Billboard’s Texts by Delphi. Source: authors, 2015-16.

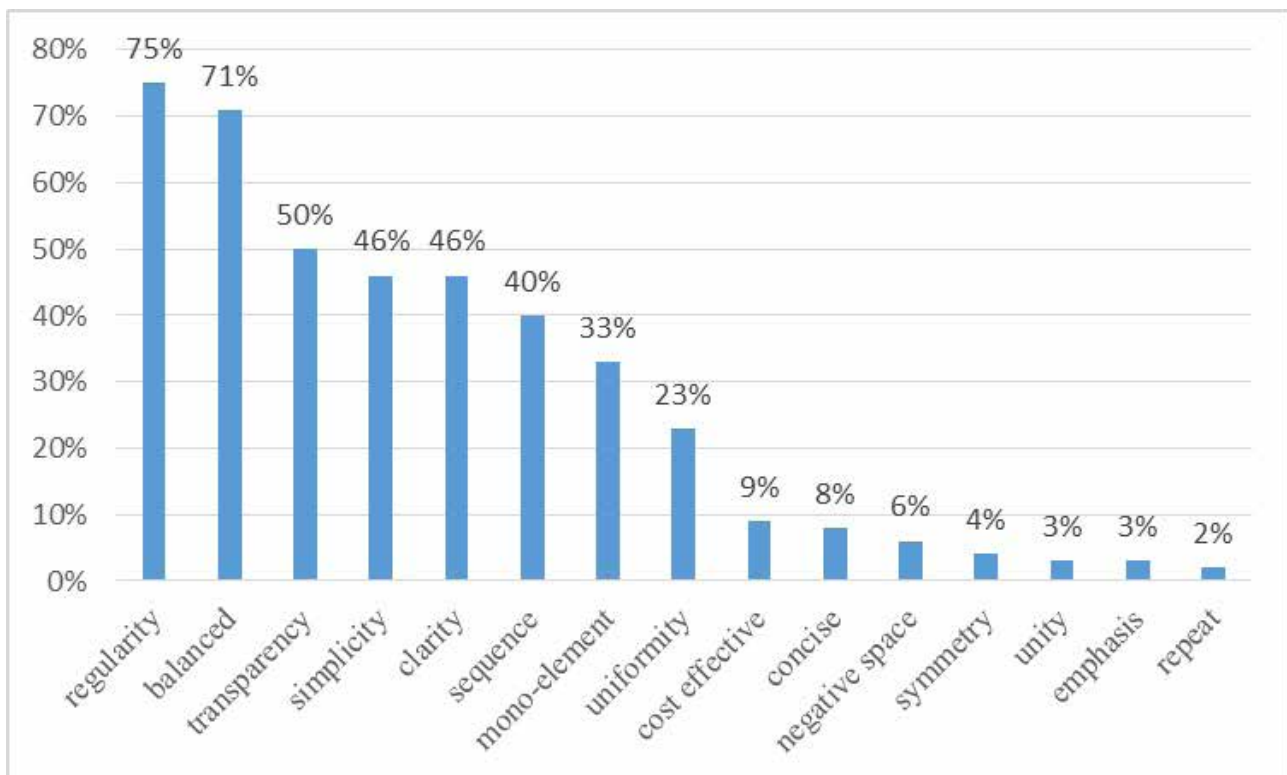


Fig. 14: Frequency of Graphic Design Principles in 150 Billboard’s Images by Delphi. Source: Authors, 2015-16

subset of inclusiveness law, use of negative space, emphasis, unity and repetition subset of Figure-ground. “Simplicity” is also the general philosophy of the Gestalt’s laws known as the “Pragnans Law”, which is the purpose of graphic design use. The clarity and transparency are also about the quality of presentation and image’s expression of each artwork. Based on the consensus of teachers and designers and the results obtained from the frequency of Gestalt visual laws of perceptions and graphic design principles in 150 billboards, the percentages of two items were compared to confirm the importance of them in all 150 samples. The categorization shows classification in table 2.

The percentages are the average of the four subgroups

of the proximity law, namely the proximity by close edge, touch, combination, and overlap, see Fig. 11 for further study. The highest percentage (77%) of proximity by touch is highest.

Percentage is the average of the three subgroups of similarity law, namely, size, shape and color.

The comparison and confirmation of the classification by the professors and designers in the Delphi method, the relationship between Gestalt’s laws and design principles is shown in Figure 15. So far, no studies have been done in this subject but based on the results analysis, application and grouping of perception’s laws and design principles can be expected to have a mutual interaction.

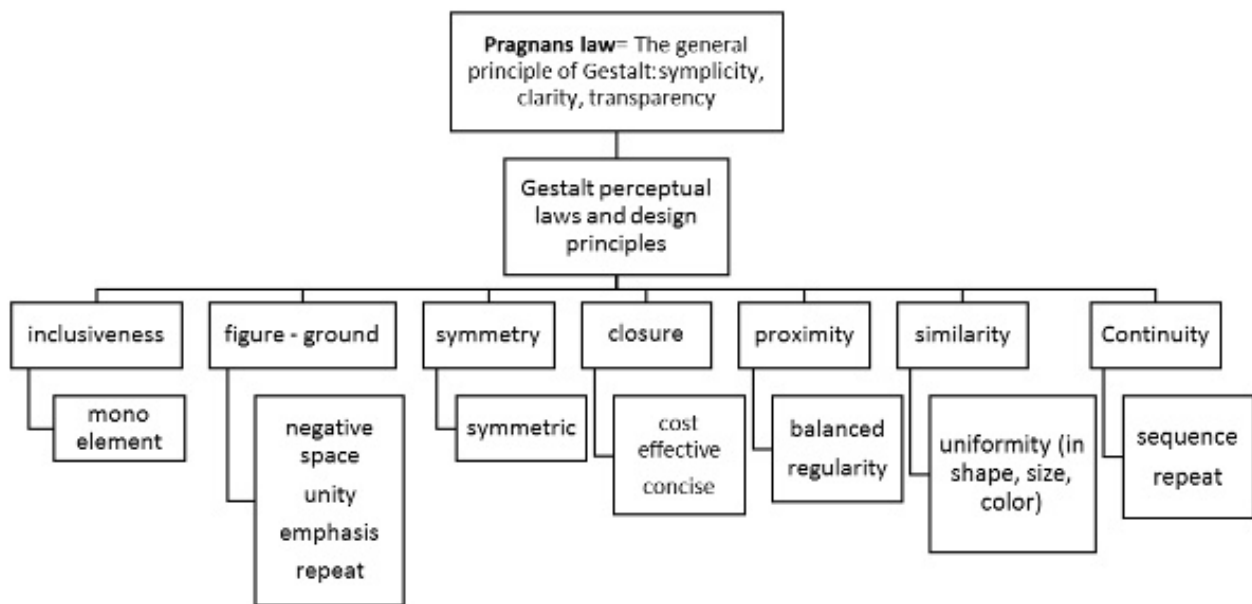


Fig 15. Comparison of Gestalt perceptual laws and graphic design principles by Delphi method. Source: authors, 2017.

Conclusion

Considering the review of Gestalt visual perceptual laws in the images and texts design of Tehran’s billboard in 2015-16 and their graphic design principles, some aspects of billboard graphic design are defined: Gestalt perceptual laws are widely used in Tehran’s commercial billboard graphic design and this may suggest that

Table 2. Comparison and Classification of Graphic Design Principles and Gestalt Visual Perception Laws in 150 Billboard's Images and Texts based on Their Frequency of Them by the Delphi method. Source: authors, 2014-2015

Gestalt Perceptual Laws	Billboard's Elements	Design Principles in Images and Texts
Figure-Ground	Texts (2%)	<ul style="list-style-type: none"> Negative space (4%) Unity (5%) Emphasis (3%) Repeat (3%)
	Images (3%)	<ul style="list-style-type: none"> Negative space (6%) Unity (3%) Emphasis (3%) Repeat (2%)
Symmetry	Texts (2%)	<ul style="list-style-type: none"> Symmetric (2%)
	Images (5%)	<ul style="list-style-type: none"> Symmetric (4%)
Closure	Texts (1%)	<ul style="list-style-type: none"> Cost effective (1%) Concise (1%)
	Images (9%)	<ul style="list-style-type: none"> Cost effective (9%) Concise (8%)
*Proximity	Texts (3.5%)	<ul style="list-style-type: none"> Balanced (3%) Regularity (2%)
	Images (33%)	<ul style="list-style-type: none"> Balanced (71%) Regularity (75%)
Continuity	Texts (5%)	<ul style="list-style-type: none"> Sequence (6%) Repeat (3%)
	Images (37%)	<ul style="list-style-type: none"> Sequence (40%) Repeat (2%)
**Similarity	Texts (54%)	<ul style="list-style-type: none"> Uniformity (50%)
	Images (23%)	<ul style="list-style-type: none"> Uniformity (23%)
Inclusiveness	Texts (22%)	<ul style="list-style-type: none"> Mono-element (21%)
	Images (33%)	<ul style="list-style-type: none"> Mono-element (33%)
Pragnans law		<ul style="list-style-type: none"> Simplicity (52% & 46%)
The quality of all Gestalt laws and design principles		<ul style="list-style-type: none"> Clarity (56% & 46%) Transparency (55% & 50%)

the designer's mind has involved with Gestalt's laws unconsciously in creating the artworks. The mind has a tendency to simplify by "grouping" of objects or images. The results of this study indicate that graphic designers of Tehran's billboards consciously or unknowingly used the design and composition of billboards' visual elements (image and texts) to apply Gestalt visual organizing laws. In response to the main question of the study on how Gestalt's perceptual laws apply to Tehran's billboards in 2015-16, it demonstrated that all the laws in the images and text's graphic design of all 150 billboard samples have been used even in a small amount, which indicate the importance of its use in images and text's design. Other research questions, in order to explain the billboard graphic design principles and discover the relationship between them, also express the necessity and importance of the relevant laws in the billboards' graphics design. The answer to this question is whether Gestalt can be used as a method for billboard's analysis and graphic design. To prove it, the qualitative sampling method (Delphi) of graphic design principles and the professor's consensus views and graphic designers were used in this research and the evaluation of the images and texts was based on the design principles. The results are based on frequencies of design principles, indicating the importance of graphic design in billboard's images and texts. The comparison of the results shows that each principle has a mutually interconnected relationship with one of Gestalt's laws, in other words, the graphic design principles are dominated by Gestalt's laws and on the other hand, these principles have a very effective role in shaping and creating Gestalt's laws. A survey conducted in this study shows that if Gestalt's laws are eliminated in billboard design, the effect will be unorganized and unreasonable. Probably, Gestalt perceptual laws can be considered as tools for organizing billboard graphic design, and to prove it, further studies in this field require more billboards and more recent ones. But certainly this theory can be considered as a very suitable method for analyzing and evaluating billboard's graphic design.

The present research is a start-up for the science of billboard's graphic design and to enhance positive effect on viewer's perception. Using Gestalt's laws can be a scientific approach to it and reduce visual disturbance in the billboard graphic design and how much the laws can affect the audience's visual perception of an artistic and customer's perspective in the billboard's graphic design, will be addressed in future researches. The results of this research can be useful for researchers in the field of environmental advertising, graphic designers and beauties and municipality organizations.

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