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Design a proposed measurement methodology for the aesthetics of contemporary architecture

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Abstract:

This research paper contributes to the investigation of the contribution of proposing and designing a measurement method that can determine the quality and degree of presence of different aesthetic values in the architectural work and to monitor and document the relationship between the function performed by the building and the aesthetic values present in it. The research methodology is based on defining the research problem and then presenting the importance of the research field. Determining the objectives, then studying the previous literature related to the research, defining applied study cases, choosing the proposed method of measurement, and the reasons for selecting the applied study samples, then making questionnaire forms to conduct the research survey. From universities of different schools and architectural orientations, the random method was excluded because it was not suitable for research and not obtaining misleading opinions or answers for reasons outside the scope of the research, such as poor culture or the spread of misconceptions about aesthetic values and their interrelationship with the function of the building in the public, or lack of understanding of the standards presented in the questionnaires. Then, the results were monitored, and the most important thing in the results was that (No Balance) with an average value of (2.49) is the most predominant aesthetic value in residential buildings over the rest of the other aesthetic values, while it was found that the average degree of (complexity 1.47) is the least predominant aesthetic value in residential buildings.) and (ratio and proportion 2.46) are identical, and they are the two aesthetic values that are the most dominant in educational buildings over the rest of the other aesthetic values, while it was found that the average degree of (complexity 1.37) is the least dominant aesthetic value in educational buildings, and that the average degree of (diversity 2.53) is the aesthetic value The most majority in commercial buildings over the rest of the other aesthetic values, and that the average score (unit 1.76) is the aesthetic value that is the least majority in commercial buildings over the rest of the other aesthetic values. For a better understanding of the public's sense and interpretations of the architectural aesthetic values of the different functions of the buildings to measure the extent of their awareness and to identify the taste of the general users, which has been proven by previous studies to be expensive. It differs from the taste and preference of architects and specialists in this field.

Keywords:

Architecture aesthetics scale, values of architectural aesthetic formation, function and aesthetics of architecture.

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Introduction:

Architecture is the art of creating volumes and spaces dedicated to embracing human and social functions and activities in their diversity. Based on that, it reflects in its features and forms the technical and civilizational achievements, the aesthetic and spiritual aspirations, and the material capabilities of society in an environment and a specific historical period. It is the art of creating space and a series of spaces experienced by building users over the passage Time, this void and the amount and measure of its architectural beauty were the subject of interest to designers, historians, artists, sculptors, builders and others. Or is it concentrated in the function of this building for its users as individual persons in their experience of the spaces of the building, or is the beauty based in the mutual interaction between the building, its users, and the urban surroundings.

Research problem:

The absence of accuracy in determining the physical characteristics of the environment is one of the biggest obstacles in the way of studying and analyzing the aesthetics of the architectural environment, the importance of which stems from the need to understand the general sense of beauty, knowing that what is preferred by architects is not necessarily what is preferred by the general public, and therefore the research aims at the necessary need to propose a method A measurement that can determine the quality and degree of presence of different aesthetic values in the architectural work and the extent to which they relate to the function that this performs. The problem of measuring the aesthetic aspects stands in the way of reaching a true understanding of the nature of architectural beauty**.**

The aim of the research:

- Suggesting a measurement method that can determine the quality and degree of presence of different aesthetic values in the architectural work.
- Monitoring and documenting the relationship between the function performed by the building and the aesthetic values present in it.
- Monitoring and inventorying the different types of architectural aesthetic values.

Research Methodology:

To achieve the main objective of the research, the research study relies on the following methodology:

- Determine the research problem
- The importance of the research field of study.
- Setting goals and assignments
- Studying the literature and previous theoretical studies related to the research topic.
- Introducing the applied study cases and choosing the proposed research measurement method.
- Reasons for selecting applied study samples
- Making and designing questionnaire forms to conduct a survey in the field of research.
- Monitor results.

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- Interpreting and analyzing the results in the light of theories, hypotheses and previous studies.
- The necessary scientific recommendations.

1- Theoretical study:

1-1- Definition of Aesthetics:

It is a kind of philosophy that investigates beauty and theories related to its basic characteristics that can be judged on it and their relationship to the human mind [1]. (Baumgarten) also defined aesthetics as the science of knowledge, the theory of arts, the science of simple knowledge, and the art of deductive thinking, based on his definition of this from His emphasis on two types of knowledge, namely the vague sensory knowledge associated with simple awareness and clear mental knowledge [2], and we find from this definition the association of beauty with sensory and analytical perceptions based on clear knowledge, and we conclude from that that beauty is difficult to define or define accurately.

1-2- Types of beauty [3]:

1-2-1- Sensual beauty:

It is felt and enjoyed by the five senses of man and is a primitive type of beauty that does not need training or explanation.

1-2-2- Emotional beauty:

It results from the excitement of the aesthetic subject of an emotional feeling or a psychological value in a person, because the aesthetic subject is linked here with memories, symbols, or any beloved psychological state.

3-2-1- Intellectual beauty:

This kind of beauty needs training to taste it because it is related to the sophistication of the individual and his culture. There is this kind of beauty in the form itself, and we can distinguish between two types of intellectual aesthetics:

A- Abstract Intellectual Beauty:

It is associated with the form alone and admiration for it itself without purpose or benefit, but only because of the quality that characterizes the form of the aesthetic object so that it becomes associated with beauty.

B- Functional Intellectual Beauty:

And it is related to reconciling the form of the form and its suitability for the function required of it and the processes that produced it, so the realization of these factors of an aesthetic subject leads to happiness resulting from an intellectual victory similar to the satisfaction of discovering the truth.

1-3- Beauty and architecture:

1-3-1- Definition of Architectural Beauty:

It is a visual characteristic that results from the influence of the shape on the feeling of compatibility between it and the forces working on its formation [4]. [5]

1-3-2- Realizing Architectural Beauty:

The enjoyment of beauty in architecture is achieved through visual perception through the visual senses in addition to the rest of the other senses in accordance with the cultural values, and from here it can be concluded that architecture can be read through the visual sense of the human being to realize the formal beauty and the civilized interpretation of the thing and taste it through the values that the human carried through Its social upbringing is

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done through knowing and studying the symbolic expression of the architectural product. [6]

1-4- Values of architectural aesthetic formation:

The values of aesthetic formation in architecture varied greatly, Figure (1), and it captured a wide visual space in which a group of multiple sciences and various technical efforts participate in achieving it. Creatively, and an essential genre of the fine spatial arts, but at the beginning of the third millennium, most of the architecture's products turned into aesthetic, utilitarian, and deliberative production, and acquired the characteristics of the technical product. A presentation and an inventory of most of the aesthetic values of the architectural formation that were discussed in previous studies of architects, and an explanation of the meaning of each aesthetic value in brief: [7], [8], [9]:

1- Containment	13- The ratio	25- Repetition
2- Horizontal.	14- Proportionality	26- Boredom
3- Vertical	15- Scale	27- Rhythm
4- Connectivity	16- Symmetry	28-Contrast
5- Disassembly	17- Balance	29-Compatibility
6- Lightness	18- Simplicity	30-Gradient
7- Heaviness	19- Complexity	31- Similarities
8- void	20- Flatness	32-Conformity
9- The Solid	21- Depth	33-Diversity
10- Texture	22- Agility	34-Unit
11- Sharpness	23- Streamlined	35- Control
12- Expression	24- Transparency	36- Originality

Figure (1) shows the values of architectural aesthetic formation. Source: researcher.

Table (1) shows the values of architectural aesthetic formation. Source: researcher.

The aesthetic value of the architectural formation	Picture
1- Containment: It is a characteristic of the formation of architectural blocks, as if the blocks contain specific external spaces between them. And it can be defined as a sense that reaches the user as soon as he approaches the building, where the formation of blocks helps him to feel that the building contains the person or that the user has become in the vicinity of the building	
2- Horizontal: Horizontal means that the building or most of its various elements take the horizontal direction parallel to the ground.	
3- Vertical: It is the opposite of the horizontal, and means the use of blocks characterized by high heights in relation to its dimensions in the horizontal plan, and the horizontal block is treated with vertical lines (openings - elements) to reduce the sharpness of the horizontal.	
4- Connectivity: It means the interconnection of the elements or blocks that make up the building at the level of the different floors, as well as the interconnection of the elements of the architectural formation and the interconnection of the plastic sections that make up the architectural formation process.	
5- Disassembly: It means analyzing the elements of the building into its architectural and plastic components and then rebuilding these components under new relationships so that the building is in a new shape and form.	
6- Lightness: It is a feeling generated by the viewer as a result of using materials with a soft texture, or raising buildings on pillars, as well as the multiplication of glass surfaces in the external facades.	

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7- Heaviness: It is a feeling that reaches the viewer as a result of the use of building materials with a rough texture such as bricks and stones, as well as due to the placement of the building directly on the ground.	
8- void: It is the opposite of the solid, and the hollow refers to the openings in the building or the recessed parts in the architectural formation, and it may sometimes be called negative in the architectural formation.	
9- The Solid: The solid in the architectural formation refers to the walls or solid blocks, which are the parts that are free of openings, and it is sometimes called positive in the architectural formation, whether in the horizontal plan or the external facades.	
10- Texture: Texture is defined as a set of properties that determine the surface feature. Each texture material differs from others, such as roughness and smoothness. A person recognizes these properties at first sight by vision, then verifies them by touch and uses texture in its various types to reach a sense that the building wants to achieve and its architectural connection to the viewer.	
11- Sharpness: It is a feeling that reaches the viewer as a result of the use of sharp broken lines in the process of architectural formation.	
12- Expression: The concept of expression can be understood through three meanings: Symbolic expression: about a specific purpose of the building. Functional expression: the expression of the building means the function for which it was established, and the structural expression: the expression of the building means the structural system followed in the construction of the building.	
13- The ratio: The ratio is a relationship between the dimensions of the different elements in the building: internal and external spaces - movement elements - openings - architectural formation elements.	
14- Proportionality: Proportionality is the relationship of the dimensions of the elements in relation to each other: the proportions of one window in relation to another window - the proportions of space in relation to another space. The ratio of one building to another.	
15- Scale: The scale means the relationship of the dimensions of the elements in relation to the dimensions and types of humans: Memorial: It shows a great proportion between the dimensions of the building or the element and the dimensions of the human being. and it is difficult to comprehend it. Human: It shows a reasonable proportion between the dimensions of the building or the element and the dimensions of the human being... And it shows the perception of the elements in an overall way. Friendly: It shows the relationship in a more intimate way... and the details can be understood.	

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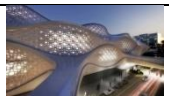
16- Symmetry: Symmetry in the architectural composition means that there is an axis, whether vertical, horizontal or inclined, in which the elements located on either side are similar.	
17- Balance: It means the static balance of the building, which is called the structural balance. There is also the plastic balance, which means the balance of the building mass or the group of blocks that make up the building. The balance may be horizontal around a vertical axis, or the balance may be vertical around a horizontal axis. - Complete equilibrium: It means the equilibrium of all the elements that make up the building, as well as the elements of formation from which all destinations are composed. - Partial equilibrium: It means the equilibrium of some elements of the building, as if the blocks are balanced and there is no equilibrium in the architectural formation of all destinations or vice versa.	
18- Simplicity: In the process of architectural formation through the simplicity of the blocks, so that the building consists of several blocks characterized by the simplicity of the engineering composition and dispensing with the decorations and everything that is not related to the utilitarian function of the architectural work.	
19- Complexity: Complexity in architecture is the opposite of simplicity, and it includes the architectural formation containing complexities in the installation of elements and means of architectural formation, whether in the horizontal plan, in the facades, or in the architectural blocks in general. The lack of clarity of movement in the horizontal projection leads to complexity, and the use of contradictory shapes in the formation of the projection and the interface leads to complexity.	
20- Flatness: This concept is specific to the design and formation of the architectural facades of the building, and it means the stability of the line of the external sector of the building facade with the absence of any protrusions for the floors of the building on top of each other, in addition to the smoothness of the surfaces and the texture of the building materials used.	
21- Depth: The sense of depth is related to proportions and proportionality in the functional and architectural formation of the building. Due to the increase in the length of the internal corridor in relation to its width, a sense of depth is generated for the space for movement. As a result of the increased protrusion of some parts of the façade from the openings, this suggests the depth of the façade.	
22- Agility: It is a sense that follows the sense of the lightness of the building, and elegance is achieved in the architectural formation by increasing the proportions used, for example, the ratio 2:1 does not achieve the concept of gracefulness in the architectural elements, while this feeling can be achieved if the ratio is increased to 1:10, for example. This concept is mainly concentrated in the formation of the pivot elements that appear in the internal spaces, such as the columns in the hall of the Karnak Temple.	
23- Streamlined: This feeling comes from the use of curved lines that achieve the fluidity of the building in any direction. The fluidity also expresses the fluidity of movement in the horizontal plan between the	

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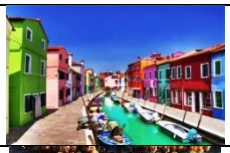
different spaces, or the fluidity of the internal space through the connection between it and the external space or between it and another space.	
24- Transparency: It is a feeling that results from the use of glass as a transparent material abundantly in the exterior facades of the building, as those inside can easily see the outside, and the sense of this concept is magnified when there is no need for privacy, as transparent glass is used that also allows those outside to see the inner depth of the spaces and their ceilings.	
25- Repetition: It means the regular repetition of the formation elements more than once, and it may be at the level of facades or blocks.	
26- Boredom: It happens because of the regular repetition where the architectural sentence loses the characteristic of diversity and the viewer loses the expectation and sense of change	
27- Rhythm: It is an irregular repetition of the same components of the repetition, but it is separated by commas, and it can be a regular or irregular rhythm.	
28-Contrast: It is a property to achieve differentiation and contrast in architectural blocks and facades, and it may be color contrast, mass contrast, functional contrast, or plastic contrast.	
29-Compatibility: Compatibility is the harmony in architectural buildings and it may be a color compatibility or a mass compatibility in terms of the shape of the blocks and heights or a formative compatibility such as the compatibility of straight lines with each other, and the compatibility of curved lines with each other, or a functional compatibility as a configuration with one job uses.	
30-Gradient: The gradient is divided into two parts, a color gradient, and it occurs when the designer uses a color gradient in the facades, and the gradient begins between two colors, or a mass gradient, and it may be at the level of heights or in their position in the horizontal projection and the general location.	
31- Similarities: It means the similarity of two things in many features and the difference in some other features, such as the similarity of blocks or building elements such as building facades or architectural treatments.	
32-Conformity: Contrary to similarity, congruence is: the congruence of two things in all features, such as congruence of building blocks, congruence of building elements, congruence of building destinations.	
33-Diversity: It is the opposite of repetition and means that there is a difference between the constituent elements of the building and can be achieved through the diversity of blocks - the diversity of openings - the diversity of building materials - the diversity of colors - the diversity of forming elements.	

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34-Unit: It is to follow a unified method to link the elements to each other and give them a unified character. It can be achieved through: unity of color - unity of texture - unity of material - unity of formation elements.	
35- Control: It is the supremacy of part of the configuration parts of the building over the other parts of the surrounding buildings to form a center to attract attention and impose visual control.	
36- Originality: It means that the architectural formations used have ancient origins from the vocabulary of heritage architecture.	

1-5-Function:

The concept and importance of the function in architecture is that it is not only limited to taking into account the paths of movement, lighting and ventilation needs, spatial relations, technical requirements, elements of communication, movement, etc., but it goes beyond them to include all biological, psychological, cultural and social human needs, and from here the Functionalism Theory emerged, which is one of the most important theories of science The architect bears the slogan that architecture is a pure science and not an art, and that the architectural form adheres to and follows the function and may not rebel against it in any case. Functionalism began as a theory in architecture from the nineteenth century. Le Corbusier was the most prominent one who applied this theory in all his buildings and one of the most important developers and supporters of functionalism in all its principles. Therefore, this theory is associated with the name of the architect Le Corbusier, but it is not unique to him alone. The first to appear with this theory is the American Horatio Greenough, who concluded that the architectural form must be a natural reaction to the benefit, as it happens in all creatures. Then came Louis Sullivan, who advocated that form should follow function. [10].

1-5-1- Function and aesthetics of architecture:

Architecture, without all the arts, is unique in bearing the burden of careful balancing and neutral, successful arbitration, between the “functional” and “aesthetic” in their fateful struggle within their unity in the architectural artwork, as they are its main components, and all other arts face this complex dilemma as well. However, the responsibility of the architectural artist seems to us to be greater and more massive compared to other artists, so it requires, therefore, an exceptional effort to ensure the creation of the ideal combination between the functional and the aesthetic. In the various arts, it is the aesthetic that gives way to the functional in architecture. [11] While (Robert Venturi) mentions in his book Complexity and Contradiction in Architecture that we no longer argue about the primacy of form and function, one over the other, whichever follows the other, since it is not possible for us to ignore the dependence of each on the other [12], while (Sullivan) defined the function as a force that wants to express itself, and that the functions search for their forms, and that the forms are the external manifestation of the internal forces and needs, and the functions and forms are interconnected, intertwined, and mixed [13], but the

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problem of the building's expression of the function also remains insistent, so we find that (Arnheim) defends the view that it is necessary for the building to express its function and states that the compatibility between the visual features and the function of the building is required so that people are not deceived [14], while (Simens) believes that it is not necessary in all cases that there is a direct relationship between The function and shape of the building [15], and from here we see that the intellectual and functional beauty is the only one that distinguishes architecture with its utilitarian purposes from other arts such as painting and sculpture [16]. Others believe that the architectural content is only the architectural function, which can be divided into a utilitarian function that includes space, environment and Materials, and an emotional function that includes the expressive and political aspects, and that the form is the material outcome of a mutual interaction between a social demand represented by an idea on the one hand, and its contemporary technology with its intellectual, material and subjective elements on the other hand [17].

1-6- Previous studies in the field of measuring the aesthetics of architecture:

Researchers have been alerted to the need to devise means to measure beauty and reactions towards it as a condition for studying beauty in a scientific way, and they have come up with several means to represent the built environment, some of which are descriptive using words, or using different simulation methods, or by directly representing the built environment. Among the most important studies in the field of measuring the aesthetics of architecture are the following:

1- (Sayed Al-Tuni and Nasmat Abdel-Qader 1996):

The external appearance of buildings is one of the most important areas of basic interest in the formation and treatment of facades, and this formation and treatment of facades is through respect and employment of architectural determinants and utilitarian requirements [18]

2- (1975 Zube and 1970 Sanoff)

One of the measurement methods is based on displaying a group of photographs or sketches and to identify people's actions and preferences using special scales called Rating Scales, and choosing images that represent the environment under study or what is called image sampling is one of the important topics that affect the possibility of generalizing the results of the study, as he called Some researchers need to choose a representative sample of the environment, while others called for first identifying the characteristics affecting the environment and selecting a sample based on the diversification of these characteristics. [19], [20].

3- (Groat and Bishop 1983):

They used another method, which is called multipe sorting, in which the official is asked to divide a group of images into groups so that the images in one group are somewhat similar and different from the images in other groups according to criteria determined by the official himself, and the arrangement is repeated by choosing another criterion for arrangement that is also determined by the official. This method is useful in identifying the different methods that people follow in dividing the environment, as well as the meanings associated with it. [21], [22]

4- (1974 sanoff):

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He used a method based on presenting four alternatives to design a building facade and asked the viewers to evaluate the building facades using the so-called Semantic differential scale, which is based on a list of opposing characteristics, including five grades in the middle, ranging from strength to weakness for this characteristic. [23].

5- (Krampen 1980):

He studied the relationship between some objective measures of facades and their personal evaluation, in the event that what is required is to measure and know the impact of certain aesthetic characteristics, so the problem lies in the difficulty of objective quantitative measurement of these characteristics, which are originally qualitative properties. [24].

6- (Elsheshtawy 1997):

He developed an objective method or tool for measuring the value of complexity in the built environment based on the Gestalt theory of spatial organization. [25].

2- Applied study:

This applied research study is an important step towards understanding architectural aesthetic values and the mutual influence between them and the function of the building, and formulating a proposed methodology for measuring these values in contemporary buildings through analyzing and monitoring some examples and the reasons for choosing examples:

• Examples of buildings of contemporary architecture.

• The pictures of the buildings were selected as realistic examples from (Egypt and the world) for the types of jobs under study.

• The most expressive examples of the selected aesthetic values under the applied research study were selected.

• The types of functions of the buildings under the research study were selected based on the most influential functions in the lives of the users on a daily basis for most of them (residential - educational - commercial)

The applied study was carried out in successive stages as follows:

1- The stage of selecting the study sample.

2- The stage of conducting a survey and questionnaires and designing the proposed methodology.

3- The stage of statistical measurement and calibration using the SPSS statistics program.

4- The stage of comparison, evaluation and formulation of results.

As follows:

<u>1- The stage of selecting the study sample:</u>

The research study sample was selected from 60 people of architects, designers, specialists in the field of architecture, and students of the architecture department in a number of universities with different schools and architectural orientations to which the study sample belongs. The scope of the research, such as poor culture or the spread of misconceptions about aesthetic values and their reciprocal relationship with the function of the building in the public, or lack of understanding of the standards presented in the questionnaires.

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2- The stage of conducting a survey and questionnaires and designing the proposed methodology:

A number of 12 images were selected for multiple examples of each of the residential, educational and commercial functions, and it was taken into account that the images include a diversity of architectural trends and a diversity of aesthetic values in them. Then, questionnaires were designed in which the study sample was asked to evaluate the degree of presence of values Aesthetics in each example, and it should be noted that the researcher counted the aesthetic values used for the architectural formation mentioned in previous studies, books and lectures on architecture theories, which were about 36 aesthetic values as mentioned in the previous table (Table 1), and the researcher found that it is possible to collect and summarize them in 12 values Aesthetics represent the most common and influential space users from the point of view of specialists and architects and their use in the applied study of the research, and they are (containment, balance, proportions, complexity, compatibility and harmony, opposition and contrast, diversity, symmetry, rhythm, unity, fluidity).

3- The stage of statistical measurement and calibration using the SPSS statistics program:

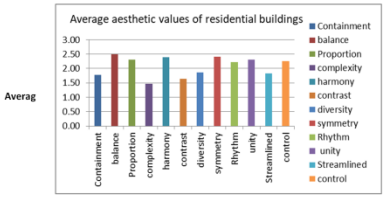
A scale of three degrees (strong - medium - weak) was used to identify the degree of presence of aesthetic values in the images representing buildings with different functions. The questionnaires were unloaded and the inputs were included for the SPSS statistical analysis program and the necessary data tables and graphs were made.

4- The sage of comparison, evaluation and formulation of results and conclusions:

At this stage, comparison and evaluation were carried out in two parts:

First: comparison and comparison between averages of aesthetic values at the level of each building function:

Table 2: shows a comparison between the averages of the degree of having the aesthetic value for each function separately. Source: the researcher.

No.	building function	Results			Graph	Conclusions
1	Residential	1	Containment Average	1.77		• It was found from the statistical analysis that the average score (2.49 balance) is the most dominant aesthetic value in residential buildings over the rest of the other aesthetic values. • It was also found from the statistical analysis that the average score (Rhythm.222) is the average aesthetic value common in residential
		2	balance Average	2.49		
		3	Proportion Average	2.31		
		4	complexity Average	1.47		
		5	harmony Average	2.4		
		6	contrast Average	1.64		
		7	diversity Average	1.87		

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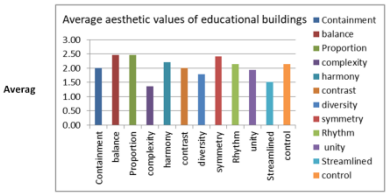
		8	symmetry Average	**2.41**		buildings over the rest of the other aesthetic values. • Then, from the statistical analysis, it was found that the average degree (complexity 1.47) is the aesthetic value that is less dominant in residential buildings than the other aesthetic values.
		9	Rhythm Average	**2.22**		
		10	unity Average	**2.31**		
		11	Streamlined Average	**1.83**		
		12	control Average	**2.26**		
	building function	**Results**			**Graph**	**Conclusions**
2	**Educational**	**1**	Containment Average	**2.00**		• It was found from the statistical analysis that the average scores (2.46 balance) and (2.46 ratio and proportion) are identical, and they are the two aesthetic values that are the most dominant in educational buildings over the rest of the other aesthetic values. • It was also found from the statistical analysis that the average score (unit 1.94) is the average aesthetic value common in educational buildings over the rest of the other aesthetic values. • Then, from the statistical analysis, it was found that the average degree (1.37 complexity) is the aesthetic value that is the least majority in educational buildings over the rest of the other aesthetic values.
		2	balance Average	**2.46**		
		3	Proportion Average	**2.46**		
		4	complexity Average	**1.37**		
		5	harmony Average	**2.21**		
		6	contrast Average	**2**		
		7	diversity Average	**1.78**		
		8	symmetry Average	**2.42**		
		9	Rhythm Average	**2.15**		
		10	unity Average	**1.94**		
		11	Streamlined Average	**1.52**		
		12	control Average	**2.15**		
	building function	**Results**			**Graph**	**Conclusions**
3		**1**	Containment Average	**1.93**		• It was found from the statistical analysis that the

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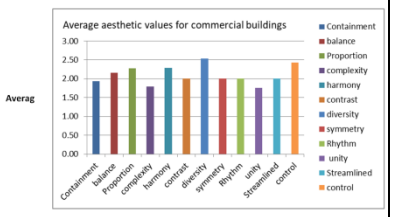
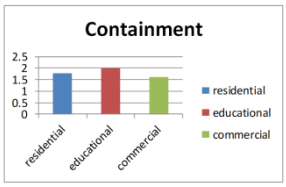
	Commercial	**2**	balance Average	**2.16**		average score (diversity 2.53) is the most dominant aesthetic value in commercial buildings over the rest of the other aesthetic values. • It was also found from the statistical analysis that the average degree (2.16 balance) is the average aesthetic value common in commercial buildings over the rest of the other aesthetic values. • Then, from the statistical analysis, it was found that the average score (unit 1.76) is the aesthetic value that is less dominant in commercial buildings than the other aesthetic values.
		3	Proportion Average	**2.28**		
		4	complexity Average	**1.79**		
		5	harmony Average	**2.29**		
		6	contrast Average	**2**		
		7	diversity Average	**2.53**		
		8	symmetry Average	**2**		
		9	Rhythm Average	**2**		
		10	unity Average	**1.76**		
		11	Streamlined Average	**2**		
		12	control Average	**2.43**		

Second: comparison and comparison between the different functions of buildings and their impact on the degree of presence of aesthetic value in them:

Table 3: Shows a comparison between the different functions of buildings and their impact on the degree of presence of aesthetic value in them. Source: researcher.

No	Aesthetic Value	Results		Graph	Conclusions
1	Containment	Residential	1.77		From the statistical analysis, it was found that the educational buildings are characterized by the largest amount of containment value, with an average score of (2), while the sense of containment gradually decreases among users in residential buildings, with an average score of (1.77), and then commercial buildings come with the lowest percentage of the sense of users to contain it, with an average score of (1.60).
		Educational	2		
		Commercial	1.60		

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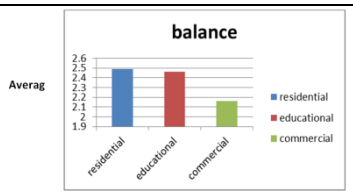
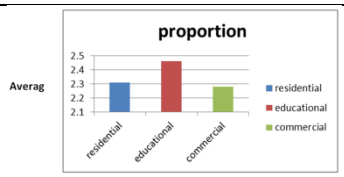
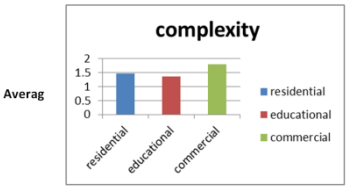
2	Balance	Residential	2.49		From the statistical analysis, it was found that the residential buildings are characterized by the largest amount of the value of balance, with an average score of (2.49), while the sense of a slight difference in the value of balance gradually decreases among users in educational buildings, with an average score of (2.46), and then commercial buildings come with the lowest. Percentage when users feel contained in it, with an average score of (2.16).
		Educational	2.46		
		Commercial	2.16		
3	Proportion	Residential	2.31		It was found from the statistical analysis that the educational buildings are characterized by the greatest amount of the value of ratio and proportionality, with an average score of (2.46), while the feeling of proportion and proportionality gradually decreases among users in residential buildings, with an average score of (2.31), and then commercial buildings come with the lowest percentage. The users' feeling of proportion and proportionality, with an average score of (2.28).
		Educational	2.46		
		Commercial	2.28		
4	Complexity	Residential	1.47		It was found from the statistical analysis that the commercial buildings are distinguished by the greatest amount of complexity value, with an average score of (1.79), while the sense of complexity gradually decreases among users in residential buildings, with an average score of
		Educational	1.37		
		Commercial	1.79		

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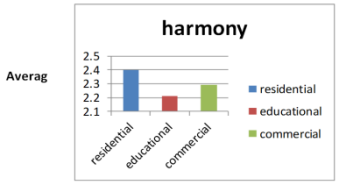
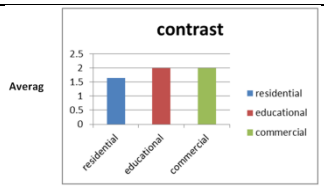
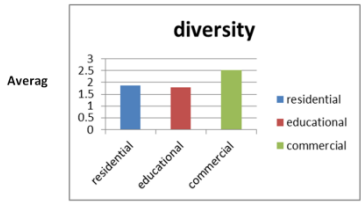
					(1.47), and then educational buildings come with the lowest percentage for the sense of users with complexity, with an average score of (1.37).
5	Harmony	Residential	2.4		From the statistical analysis of the value of harmony, it was found that the degree of its presence is similar in all the functions of the selected buildings, indicating that the residential buildings are characterized by the largest amount of the value of harmony, with an average degree of (2.4), while the sense of harmony gradually decreases among users in commercial buildings, with an average degree of (2.29). Then, the educational buildings come with the lowest percentage when users feel harmony with them, with an average score of (2.21).
		Educational	2.21		
		Commercial	2.29		
6	Contrast	Residential	1.64		It was found from the statistical analysis that the educational and commercial buildings are characterized by the largest amount of contrast value together, with an average score of (2), while the sense of contrast decreases gradually among users in residential buildings, with an average score of (1.64).
		Educational	2		
		Commercial	2		
7	Diversity	residential	1.87		It was found from the statistical analysis that the commercial buildings are distinguished by the greatest amount of the value of diversity, with an average score of (2.53), while the sense of diversity gradually decreases among users in residential buildings, with an average score of (1.87), and then educational buildings come with the lowest percentage of the sense of
		educational	1.78		
		commercial	2.53		

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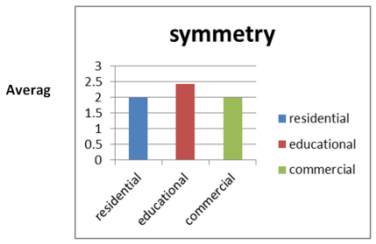
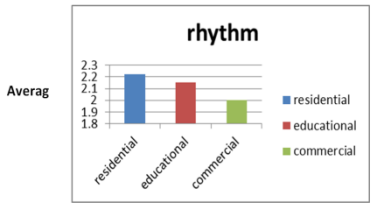
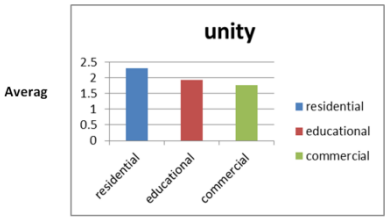
					The users varied in it, with an average score of (1.78).
8	Symmetry	residential	2.41		From the statistical analysis, it was found that the educational buildings are characterized by the largest amount of the value of symmetry, with an average score of (2.42), while the sense of symmetry among users in residential buildings decreases by a very slight percentage, with an average score of (2.41), and then commercial buildings come with the lowest percentage. It is noticeable when users feel similar to it, with an average score of (2).
		educational	2.42		
		commercial	2		
9	Rhythm	residential	2.22		From the statistical analysis, it was found that the residential buildings are characterized by the greatest amount of the value of rhythm, with an average score of (2.22), while the sense of the value of rhythm gradually decreases among users in educational buildings, with an average score of (2.15), and then commercial buildings come with the least noticeable percentage for Users' sense of rhythm, with an average score of (2).
		educational	2.15		
		commercial	2		
10	Unity	residential	2.31		From the statistical analysis, it was found that residential buildings are characterized by the largest amount of unit value, with an average score of (2.31), while the feeling of unit value gradually decreases among users in educational buildings, with an average score of (1.94), and then commercial buildings come with the lowest percentage for Users' sentiment was unit, with an average score of (1.76).
		educational	1.94		
		commercial	1.76		

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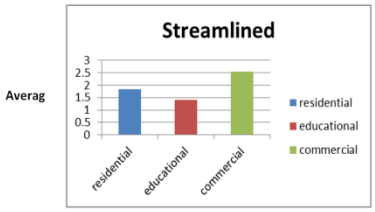
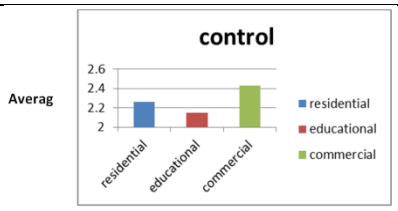
11	Streamlined	residential	1.83		From the statistical analysis, it was found that the commercial buildings are characterized by the largest amount of the value of Streamlined, with an average score of (2.53), while the feeling of streamlining gradually decreases among users in residential buildings, with an average score of (1.83), and then educational buildings come with the lowest noticeable percentage. Users' feelings about Streamlined, with an average score of (1.41).
		educational	1.41		
		commercial	2.53		
12	Control	residential	2.26		It was found from the statistical analysis that commercial buildings are characterized by the greatest amount of control value, with an average score of (2.43), while the sense of control gradually decreases among users in residential buildings, with an average score of (2.26), and then educational buildings come with the lowest noticeable percentage for Users' sense of control, with an average score of (2.15).
		educational	2.15		
		commercial	2.43		

3- Discussion and general conclusions:

1- After conducting a comparison between the averages of aesthetic values at the level of each function of the buildings separately, it is now possible to arrange the extent and degree of presence of aesthetic values from the point of view of the selected study sample in descending order from strongest to weakest in presence in residential buildings as follows:

- The average balance value in all residential examples is 2.49
- The average value of similarity in all residential examples is 2.41
- The average value of harmony in all residential examples is 2.4
- The average value of ratio and proportionality in all residential examples is 2.31
- The average unit value in all residential examples is 2.31
- The average control value in all residential examples is 2.26
- The average value of percussion in all residential examples is 2.22
- The average value of diversity in all residential examples is 1.87
- The average value of flow in all residential examples is 1.83
- The average containment value in all residential examples is 1.77

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- The average value of contrast in all residential examples is 1.64
- The average value of complexity in all residential examples is 1.47

2 - After making a comparison between the averages of the aesthetic values at the level of each function of the buildings separately, it is now possible to arrange the extent and degree of the presence of the aesthetic values from the point of view of the selected study sample in descending order from the strongest to the weakest in presence in the educational buildings as follows:

- The average balance value in all educational examples is 2.46
- The average value of ratio and proportionality in all educational examples is 2.46
- The average value of symmetry in all educational examples is 2.42
- The average value of harmony in all educational examples is 2.21
- The average value of rhythm in all educational examples is 2.15
- The average control value in all educational examples is 2.15
- The average value of containment in all educational examples 2
- The average value of contrast in all educational examples 2
- The average unit value in all learning examples is 1.94
- The average value of diversity in all educational examples is 1.78
- The average value of streamlining in all educational examples is 1.52
- The average value of complexity in all educational examples is 1.37

3 - After making a comparison between the averages of the aesthetic values at the level of each function of the buildings separately, it is now possible to arrange the extent and degree of the presence of aesthetic values from the point of view of the selected study sample in descending order from the strongest to the weakest in presence in commercial buildings as follows:

- The average value of diversity in all commercial examples is 2.53
- The average value of flow in all commercial examples is 2.53
- The average control value in all trading examples is 2.43
- The average value of harmony in all trading examples is 2.29
- The average value of ratio and proportionality in all commercial examples is 2.28
- The average value of equilibrium in all commercial examples is 2.16
- The average contrast value in all commercial examples 2
- The average value of symmetry in all commercial examples 2
- The average value of the rhythm in all trading examples 2
- The average value of containment in all commercial examples is 1.93
- The average value of complexity in all commercial examples is 1.79
- The average unit value in all commercial examples is 1.76

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4- Future studies and suggested recommendations:

1- The research proposes applying the applied research study on a wider scale and on a larger scale on all segments of society in order to better understand the public's sense and interpretations of the architectural aesthetic values in the different functions of the buildings to measure the extent of their awareness and identify the taste of the general users, which has been proven from previous studies that it often differs from the taste and preference of architects and specialists. In this area.

2- The need to increase cultural and scientific awareness among designers and the community on what is being developed of new aesthetic values that keep pace with contemporary architecture around the world.

3- The necessity of applying and including what has been reached from the results of this proposed methodology to measure contemporary aesthetics in architecture and the extent to which it is affected by the different function of the building and adding it within the academic curricula in specialized colleges such as engineering and applied arts so that students can keep up with the findings of scientific research studies and recent experiences in this field. .

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5-Appendices:

Questionnaire forms ‹Source: Researcher:

Analysis of images of 12 models of the following buildings for each function in terms of the presence of the following aesthetic values in the buildings (containment - balance - ratio and proportion - complexity - harmony - inconsistency and contrast - diversity - consistency - rhythm - unity - fluidity - control) in terms of being (strong, medium, weak):

First: Residential buildings:

												example / aesthetic value
	strong		strong		strong		strong		strong		strong	Containment
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	equanimity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Proportion
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	complexity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	harmony
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	contrast
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Diversity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	symmetry
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	tempo
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Unit
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	streamlined
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	the control
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	

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						example / aesthetic value
strong	strong	strong	strong	strong	strong	Containment
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	equanimity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Proportion
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	complexity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	harmony
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Contrast and contrast
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Diversity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	symmetry
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	tempo
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Unit
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	streamlined
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	the control
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	

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Second: educational buildings:

												example / aesthetic value
	strong		strong		strong		strong		strong		strong	Containment
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	equanimity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Proportion
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	complexity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	harmony
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Contrast and contrast
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Diversity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	symmetry
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	tempo
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Unit
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	streamlined
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	the control
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	

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												example / aesthetic value
	strong		strong		strong		strong		strong		strong	Containment
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	equanimity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Proportion
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	complexity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	harmony
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Contrast and contrast
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Diversity
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	symmetry
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	tempo
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	Unit
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	streamlined
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	
	strong		strong		strong		strong		strong		strong	the control
	Medium		Medium		Medium		Medium		Medium		Medium	
	weak		weak		weak		weak		weak		weak	

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Third: commercial buildings (malls):

						example / aesthetic value
strong	strong	strong	strong	strong	strong	Containment
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	equanimity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Proportion
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	complexity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	harmony
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Contrast and contrast
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Diversity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	symmetry
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	tempo
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Unit
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	streamlined
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	the control
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	

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						example / aesthetic value
strong	strong	strong	strong	strong	strong	Containment
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	equanimity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Proportion
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	complexity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	harmony
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Contrast and contrast
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Diversity
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	symmetry
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	tempo
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	Unit
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	streamlined
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	
strong	strong	strong	strong	strong	strong	the control
Medium	Medium	Medium	Medium	Medium	Medium	
weak	weak	weak	weak	weak	weak	