International Journal of Psychology , Social and Educational Sciences
Vol.1, NO.3 , P: 200 - 215
Received : 18 mar 2019
Accepted : 20 May 2019

Provide a model based on Gestalt principles for predicting and analyzing the characteristics of life (organisms)

Mehrzad Yazdanpanah
MSc in Biology, Researcher Teacher, Master of Scientific-Educational Society of Biology, Education of Kohgiluyeh and Boyer-Ahmad Province. Yasuj, Iran.
ji.yazdanpanah@yahoo.com
Shahla Karamizadeh
M.A of Psychology, Education Kohgiluyeh and Boyer-Ahmad Province (Yasuj)
ShahlaKarami.st@gmail.com
Mohsen Tirband
PhD Student of Environment, Education Kohgiluyeh and Boyer-Ahmad Province (Yasuj)
somiclor.mohsen @gmail.com

Abstract
The main purpose of this study is to provide a model based on Gestalt principles to predict and analyze the characteristics of life. This research has been done by "logical reasoning" research method with descriptive-analytical technique. Gestalt theory is one of the most influential schools of the twentieth century that has not yet entered biology. Is it possible to analyze the structure of animals with this theory? First, the theoretical foundations of Gestalt principles and then the use of these principles and discovering their relationship, as well as the capacities of Gestalt principles in analyzing the phenomena of life and somewhat diseases have been discussed. The results showed that the adjacent principle, holistic and symmetry present stronger gestalts than other Gestalts in investigating some biological phenomena.In several cases, gestalt defects in a structure have led to disruption or disease. In Celiac disease, the principle of proximity near the edges and in quaker disease the principle of symmetry has been violated. Defense mechanisms, the action of enzymes, hormones that play a key role in the continuation of life characteristics, have adjacent gestalt. In the case of cancerous tumors, violations of overlap and the creation of non-overlapping structures have led to cancer.Using the basic model of Gestalt principles in animals, diseases can be identified on the basis of bio-gestalt violations in a timely way and necessary treatment can be taken. Using the concepts of Gestalt's theory, the unseen aspects of life and organisms will be recognized.

KeyWords: Gestalt principles, characteristics of life, biology, holistic

1. Introduction

The understanding of Gestalt's psychology is the understanding of its central concepts, which can be considered among the main concepts, Gestalt and Meydan. The German word Gestalt is translated into form, board, shape or pattern in English. The Gestalt school was Germany's first valid movement based on the test method. Their main argument was that the unkcoordial facts "do not form from irrelevant static particles", and therefore their study requires a generalistic method.They believed that perception was not an insomorphic combination of elements that successively had meaningful concepts in the mind of togetherness, but rather considered perception to be a coherent generality composed of a delegation or a Gestalt. Gestalt represents the way in which Gestalt's face is placed and set together. Capps, the author of The Language of the Image, believes that Gestalt is a material, mental or institutional nature, with coordinates that its components individually lack such coordinates. Gestalt's thesis studies the adraki processes of the brain and indicates that the

operating principle of mind, Klinger, is in a way that is received and not every component of it. The main thought in Gestalt's theory is that the role of general items is superior to their constituent elements and they have properties that are not inherently contained in those elements themselves. This point is summed up in a phrase as follows: "The whole is more than the sum of its components" [5]. Today, modern biology has characteristics that make it a progressive, capable, dynamic and promising discipline. Holistic is one of these features. Consider a jigsaw puzzle made up of many pieces. Each of its parts may seem meaningless on its own, but if we put the pieces together one by one, we see that the Juerchin components gradually find a large, general and meaningful view and show us a picture of an object familiar with it. The bodies of each animal are also composed of many components. Each of these components constitutes part of a large system that makes sense to us in the outline. Therefore, organisms are considered as a system that its components are related, so the characteristics of the system cannot be explained only by studying its components, and the relationship between the components, such as the components themselves in the formation of the organism, is more effective and the whole system is more than the sum of its components [1].

2. Theoretical Foundations and Research History

Biology is the science of life review, but it is very difficult to define life. The life-wide begins with the cell and ends with the bio-planet. Defining characteristics of life include order, syming (homeostasis), growth and development, resurmodeling, energy absorption and use process, response to environment and compromise with environment.

The Gestalt phenomenon first flourished in the mind of Max Wertheimer, a Czech-born psychologist, in 1910. It simply happened when he noticed trees, houses and other things around him outside the train while traveling by train. Although many people had observed this natural event before him, it was Wertheimer who asked himself, "Although it is certain that these objects are all fixed and lacking in movement, then what is the reason for this displacement? The only thing that's going to His mind came to mind that perhaps our perceptual process was not the same as the single feelings that make them"[6]. Wertheimer found that"Gestalt or the whole perceived experience has some speciality, such as movement that does not exist in its components." The concept of Gestalt was first introduced in contemporary philosophy and psychology by Christian One Ahern Scales. In his view, "all of our perceptions have Gestalt's qualities, but their components lack these qualities. For example, one finds a line that is made up of a number of point communities and not every single point. And similarly, a person listening to a melody does not hear its constituent notes abstractly, but rather understands the totality of melody"[6]. The root of this belief goes back to the distant times, where "in the 3rd century BC it was stated in China by a message in Tautching that, although a wheel is made of 30 spooks (rods), it is the space between bars that determines the general shape of the wheel [10]; "To make wheels, we connect the axes, but this is the space between the wheels that rotates it" [8]. The approach to the world not as an extroverted and objective reality, but as something constructed and dealt with by human perceptual processes, was a county attitude that was highly regarded by Gestalt-oriented people. What is Gestalt? Due to the widespread concept of Gestalt, there has been no direct translation of it in any language. This word means shape and form in German, in English, it is called whole organized, as if or formed [4]. In Persian, it can be considered as the equivalent of concepts such as "shape", "template", "organ", "body", "physique" or "whole" and "board", and immediately it should be added that none of these words alone express the meaning of Gestalt in full [6]. Gestalt represents the way in which the things are "Gestalt", i.a. torans, 1999. Capps, author of "The Language of Image", believes that "Gestalt is a general, mental or institutional, with coordinates that its components individually lack such coordinates". Gestalt's theory studies and considers the perceptual processes of the brain and indicates that the

operating principle of mind is holistic, comparative and accompanied by self-organized (innate) tendencies.
In the sense that in the perception of a set or structure, as Ahren Scales said and the Vertheimer proved it, it is the whole structure that is received and not every single component of it. The main thinking in Gestalt's theory is that "the role of general items outstrims over their constituent elements and have properties that are not inherently contained in those elements themselves. This point is summed up in this phrase: The whole is more than the sum of its components. The Gestalt School is one of the most well-known schools of psychology that explains how our brains understand visual information. In this article, we are going to explain to you the principles and rules of the Gestalt School of Psychology and bring you some of the characteristics of life and animals that have used these principles well. And for the first time, let's understand and describe how to understand the visual information of life and its related processes with Gestalt Biology. What attracted the attention of experts in Gestalt's theory was the findings and experiences that led to the artist's greater self-awareness in creating the work. However, there has been no evidence of Gestalt's interpretation of biology and the interpretation of its laws and principles in organizing visual perception by Gestaltist theorists in biology.

3. Research Objectives

In the field of Gestalt analysis, applied research biology has not been presented, therefore, achieving the recognition of Gestalt's theory, understanding its relationship with the concepts of life and analyzing the capacities of Gestalt's theory in analyzing the characteristics and phenomena of life are among the objectives.
This document is considered. To achieve these goals, we try to answer these questions:

4- Questions

4.1. What concepts does Gestalt's theory explain?
4.2. What criteria do these concepts provide for analyzing the characteristics of life (organisms)?

5- Introduction to Gestalt Biology

Since, according to Gestalt-oriented views, we always experience perceptual totals and not their individual components, the various color effects of a subject in different backgrounds were justifiable because the concurrent conflict is experienced based on holistic perception [10]. Gestalt translates into general meanings, shapes and forms, and according to this theory, "the whole is larger than the community of components," which means that even though each particular part has its own meaning, the whole structure can give it full meaning. This explanation means that our minds are automatically trying to simplify visual data and will be seen as a result of the total meaning of replacing separate sections. While separate sections can contain completely different meanings, the whole is able to deviate from the meanings of the components in a whole new sense. Mind means the management of the body's systems and, as we know, plays a major role in the management of the systems of the central nervous system (brain and spinal cord) and the endocrine system.
In the following, we interpret Gestalt in biology and describe its laws and principles in organizing visual perception in biology and using every principle in creation architecture. The principles or rules of the Gestalt School include: proximity principle, Similarity principle, Continuity principle, Closure principle, Figure-ground principle, Symmetry principle, common fate principle, inclusiveness principle, ,parallelism principle, Common Region principles are influenced by the pragmatic principle, which is the core of Gestalt's perceptual theory [6]
principle, Element Connectedness principle.

6. Methodology

In order to achieve the answers to the questions raised and achieve the desired goals in the theoretical field, the research method of "logical reasoning" and in the field of analyzing case samples, the research method "case research using combined solutions" and descriptive-analytical techniques have been used to explain the subject. The research approach is the theory test which is done in several case examples. Data collection method

includes the use of written resources, exploration and scientific databases [14].

Gestalt principles and its comparative study in biology

In his 1923 essay "Form Theory", which became known as the Dot Treatise, Wertheimer expressed Gestalt's first principles. Accordingly, "different Gestalts, based on our intrinsic tendencies to group or "dependent", see elements that are similar (similarity grouping), elements that are close together (proximity grouping), or those with structural savings (good continuity), are created [10]. There is a limit to the amount of information the mind can track. When the amount of visual information increases, the mind seeks to simplify them using grouping. Therefore, the principles of Gestalt play an important role in the help of the human mind. These principles have been expanded by art theorists in such a way that the most important

ones used in the analysis of artworks are: the principle of similarity, the principle of proximity, the principle of continuity, the principle of integration or completion, the relationships of form and context, the principle of common destiny and the principle of meta-cover. All of these Pratonans is our inoculation of a good and strong Gestalt or boarding in a way that, under the prevailing conditions (the perceptual power of the mind and the principles used in the result), makes it weaker than Gestalt or existing boarding. "In the context of the meaning of visual effect, good word is not a clear word. In order to use a more precise definition, it is better to say instead: less emotionally stimulating, or simpler, and without complexity, all of which are caused by a kind of symmetry"[4].

6.1. The Principle of pragnanz

According to this principle, the components that are closer together will be seen as a single set or a group. The close-up of visual elements is the easiest condition to see them together. Accordingly, where elements of a visual structure are located, it is important. In the formation of a good pragmatic, the principle of proximity or proximity is a more important factor than the principle of similarity. The use of these two principles together makes Gestalt's work stronger (Fig. 1). [1]

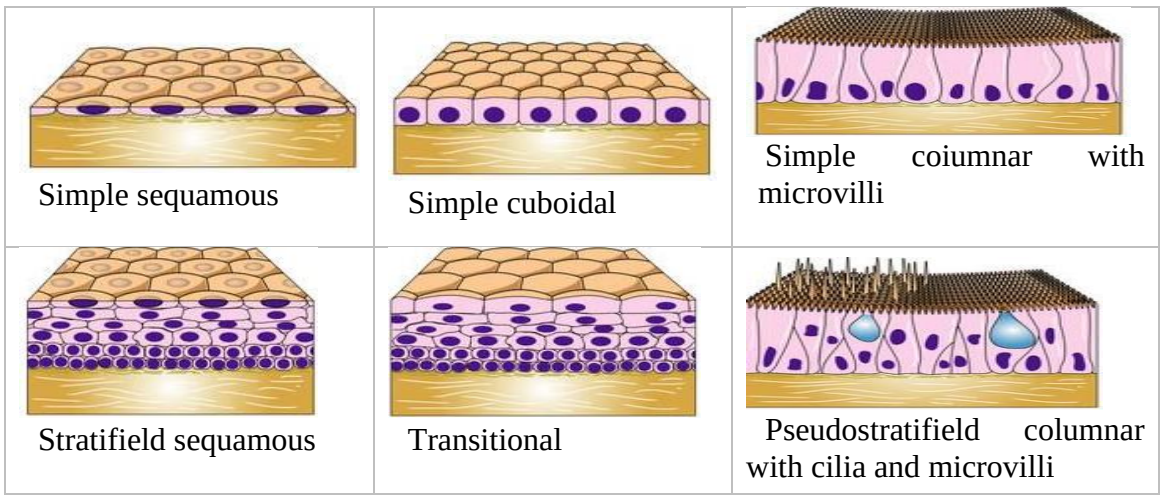


figure 1- Types of Epithelium [11]

irrelevant if they are close together, we all understand them as a single group.

This law of Gestalt psychology implies that even though shapes and elements may be

The four main types in grouping based on the principle of proximity are:

6.1.1 Near the edges: Accordingly, the more the components of a visual structure are close together, the more they will be seen as a

single group, and this happens when the edges next to the components of a structure are put together.

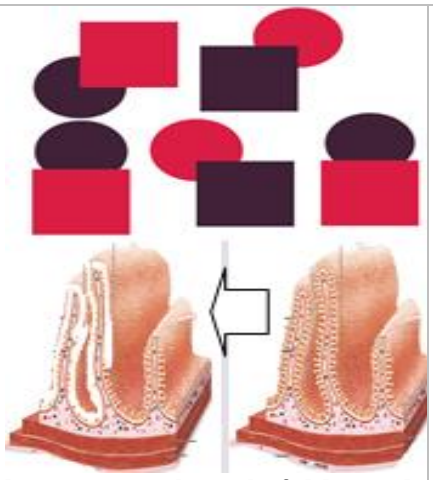
6.1.2 Contact: The components of a structure may be so close that they collide and touch each other, provided that they are still recognizable from each other. In this case, the proximity grouping is done based on contact.

6.1.3 Overlap: The strongest Gestalt occurs when elements of a visual structure cover each other without losing their independent identity.

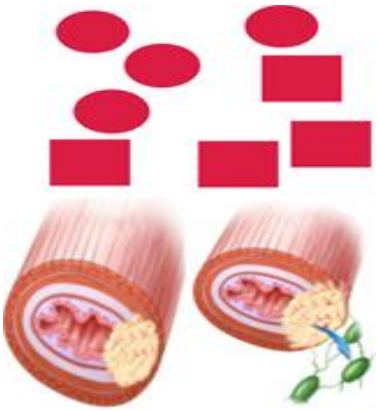
6.1.4. Integration: Another method of using the proximity principle is the use of a foreign element to group different elements of a structure together.

In general, overlap factor offers stronger gestalt than other mentioned factors. The contact agent and then the near-edge factor will be placed in the next step. stronger (Fig. 2. a-f).

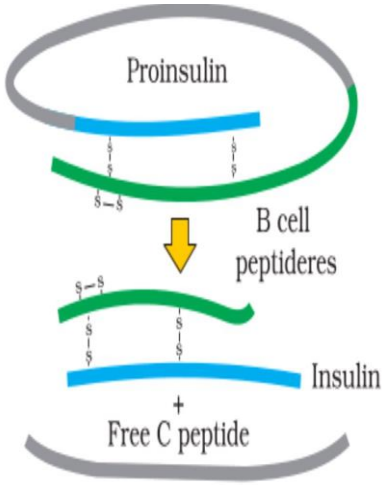
a- Genital bumps in earthworm



b- Narrow bowel folds and celiac disease



c-Cancerous tumor in the intestines and transmission to the lymph



d- Pre-insulin and c-chain removal in active insulin

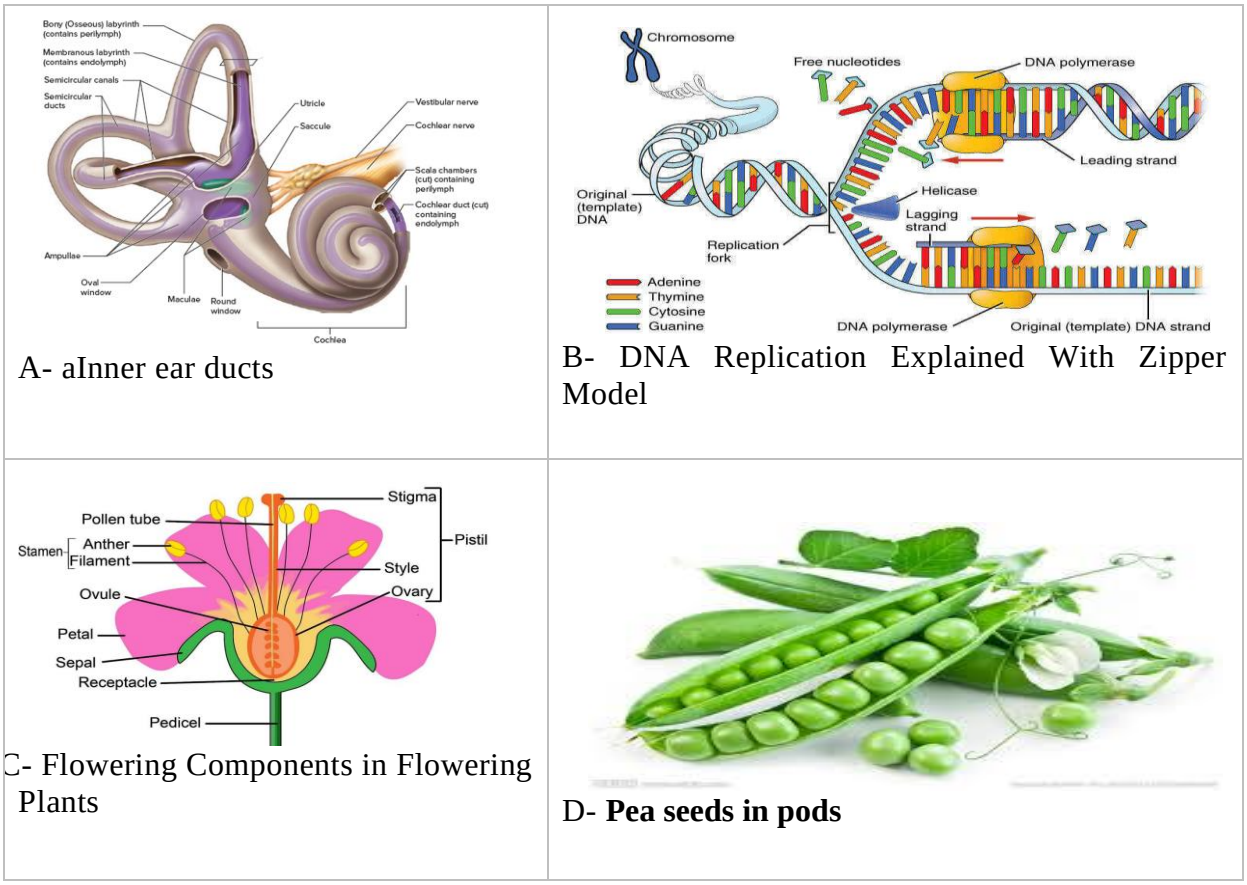
e- Monarc larvae and frills on its body

f- Electron micrograph of lethal T lymphocyte

figure 2. a-f) Types of Bio-Gestalt (Original Proximity Of Gestalt-Feature of Life) [11; 12].

6.2. The principle of similarity:

The mind simplified them to escape the confusion that occurs as a result of the arrival of very much visual information into it. Grouping similar components in a visual effect is one of the ways of this simplification. The eye inherently findelements with similar characteristics as a set. The most important types of grouping based on the similarity principle are the three main factors of size, dimensions, color and shape. In principle, similarity, grouping based on dimensions and size is a more dominant element and therefore its Gestalt is stronger than color and shape grouping (Fig. 3- a -d).



A- aInner ear ducts

B- DNA Replication Explained With Zipper Model

C- Flowering Components in Flowering Plants

D- **Pea seeds in pods**

Figure 3- A - D) Bio-Gestalt based on the principle of similarity of Gestalt- order, growth and development, resurmodeling, homostasis, response and compromise

6.3. The principle of continuity: According to the principle of continuation of stimuli with each other's dependent designs, they are received as perceptual units" [6]. In Figure 4, our eyes innately understand the movement and continuity of the entire complex (the development of a wooden lycee).

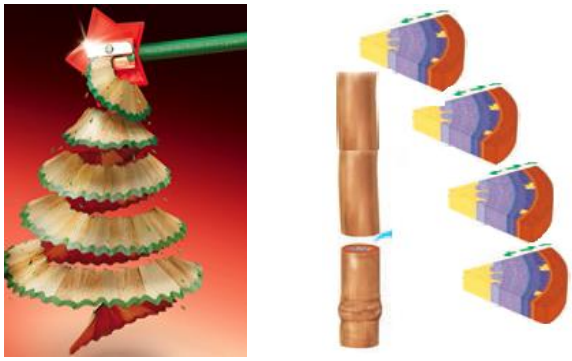


Figure 4- Gestalt Biology based on the principle of The Continuation of Gestalt-Characteristics of Life [14].

6.4. Basdar principle: Bastar is associated with continuity because it forces the eye to complete the path. As long as there is sufficient essential information, the mind prepares the missing piece of object. Bestar works best with shapes that are indissable. But complex forms are more difficult to complete in mind. The designer must strike a balance between the removed and existing sections. If the deleted parts are too much, the mind will not be able to close the shape (Fig. 5).

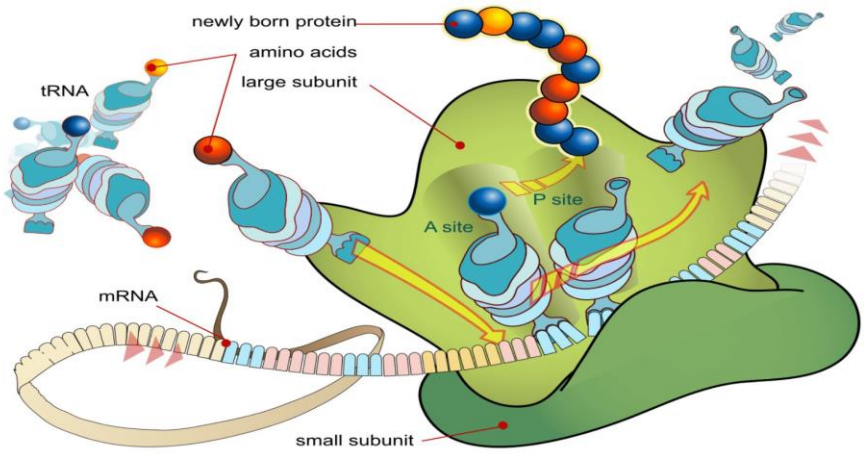
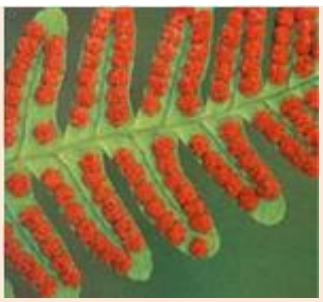


Figure 5- Process protein-making operates [11]

6.5. The principle of integration or completion: According to this principle, if a part of the image of a shape is covered or established, the mind automatically completes it and finds it in a complete form. In other words, our eyes see incomplete and unfinished forms in full and integrated. This principle is not limited to the sense of the eye, it is assumed that the same principle works in all senses [4]. Creative artists are seen in the work and recognize and complete the entire work to the audience. This principle is also used in the art of cinema, where the director of a film recognizes a part of the process of

the story to his audience. The scope of the use of the principle covers the completion of all types of arts, but its special and significant application is in visual arts and architecture. The principle of completion serves the law of pragmatics more than other Gestalt principles and plays a more effective role in its creation. The composite eye is seen in insects, consisting of a large number of independent units of vision (Fig. 6).

A) Flower pollination by honeybees



B) ginskins behind fern leaves

C) Limbic

Figure 6- Gestalt Biology Based on Integration or Completion- Characteristics of Life [11]

6.6. Form and contextual relationships: The fundamental principle is visual perception that helps us to observe an imaged structure. Viewing an image is due to the contrast between shape and context that is possible. In illustration, what is recognizable and more is dealt with is the shape and the rest of the field (Shapurian, 2007). In the opinion of, E. Dondis (1992) drew the ground by drawing or observing a shape, so this form and context are indivisible from each other (Fig. 7. a-c).

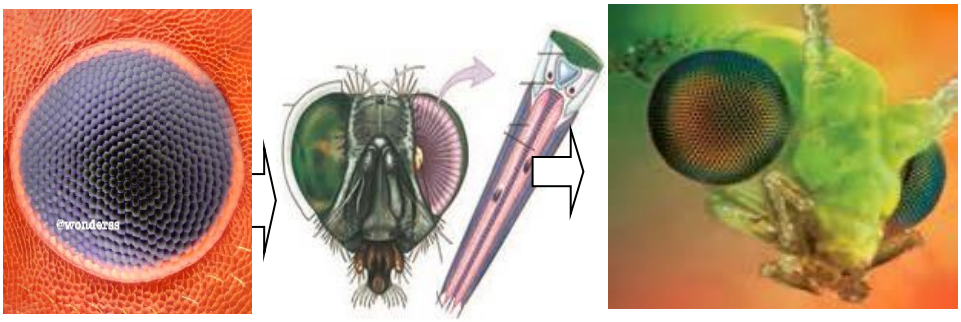
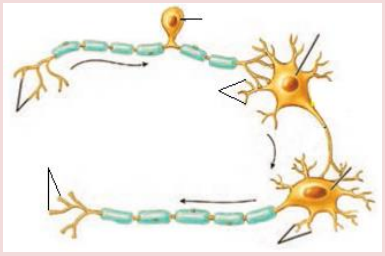
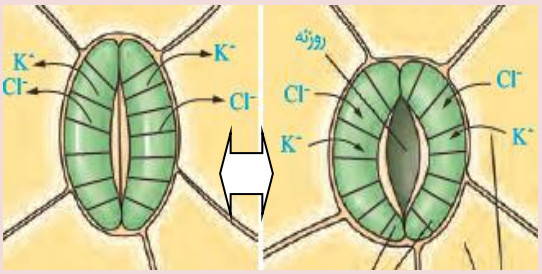


Figure 7. a - c) Gestalt Biology Based on Shape and Background Relationships - Characteristics of life[12].

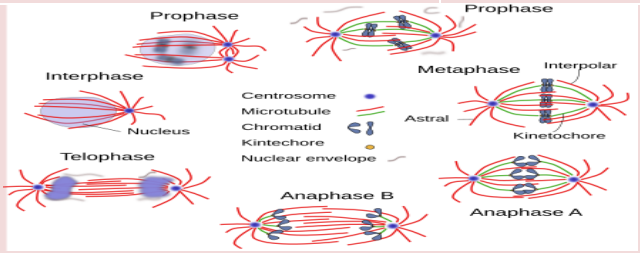
6.7. The Principle of Common Destiny: This principle relates to the movement of elements in a Gestalt. Therefore, in a visual structure, the elements that move together and in the same direction are seen as a collection



a) Neural message pathway in neurons



b) Opening and closing the guard cell of the amenth and ionic exchange



c) The movement of chromosomes during the cell division of the mews

Figure 8. a - c) Gestalt Biology Based on Common Destiny - Characteristics of Life [10]

6.8. The principle of meta-dressness: According to this principle, in a visual structure, smaller Gestalts are overshadowed by the greater Gestalts. In other words, the greater Gestalts wear small Gestalts. This principle indicates that a visual structure, in general, may be made up of several small Gestalts that are sub-available to greater Gestalts. Rezazadeh (2008) stated that this gestalt is more powerful than pragons (perfectionism) than smaller Gestalt (Fig. 8: a **and** b).

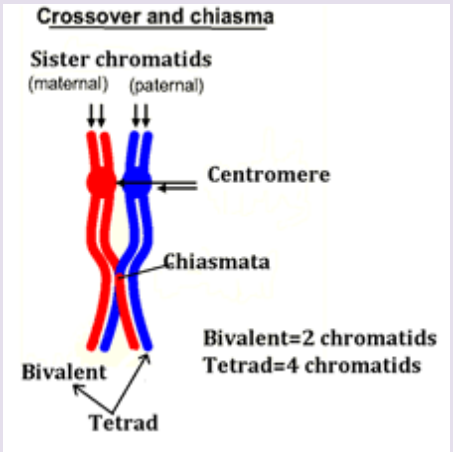


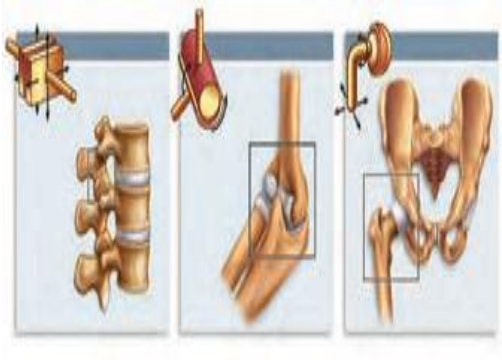
Figure a) Recombination in tetrads

Figure b) Production of asymun sex hydration

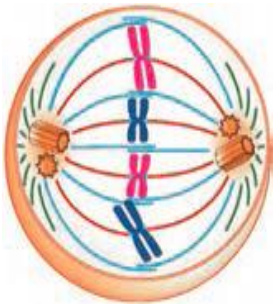
Figure 8- a and b) Gestalt Biology Based on Meta-Cover - Characteristics of Life [10]

6.9 Parallel: Elements with a very close and similar angle are known as a set. At the time of design, many times the designer is forced to bring texts and images at a certain angle in the design according to the requirements of his design, which makes the human mind know the elements that have the same angle. In the poster below this rule is well visible. Centriols are a pair of perpendicular stonys, and the joints are banded together at a certain angle, and the neuron is associated with another 10,000 cells in a 3D structure (Fig. 9. **a- c**).

a) neuron with multiple synapses



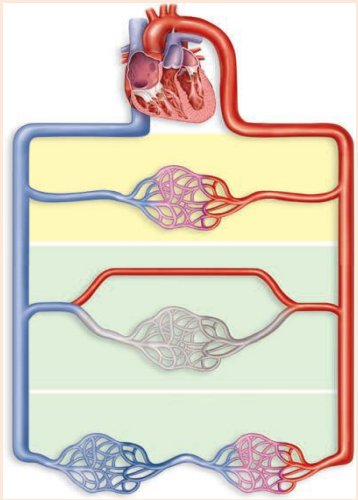
b) Types Of Joints



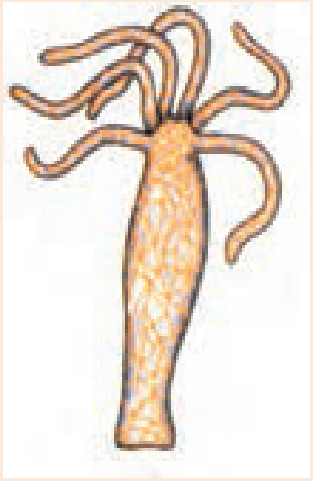
c) Centriols

Figure 9. A- C) Gestalt Biology based on Parallel - Characteristics of Life [11].

6.10. Common Region: When we see a few elements in one area, the human mind considers them to be related in one group (Fig10. a - c).



A) Circulatory system in humans



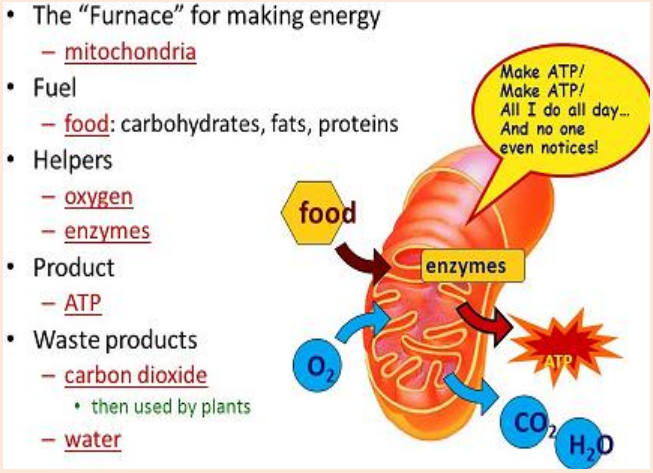
B) The nerve hydral system

C) Limbic machine

Figure 10. a – c: Gestalt Biology by Common Region - Characteristics of Life [11].

6.11. The connected element: The human mind considers the elements connected to each other one by one (Fig. 11- a and b)

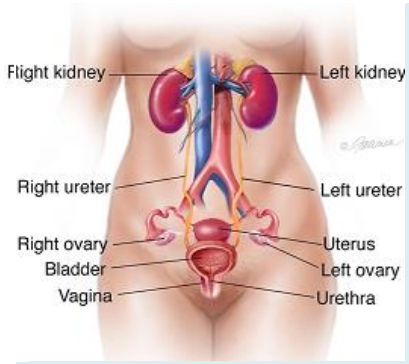
A) The human gastrointestinal tract located in the abdominal cavity



B) Mitochondrial components and ATP production path

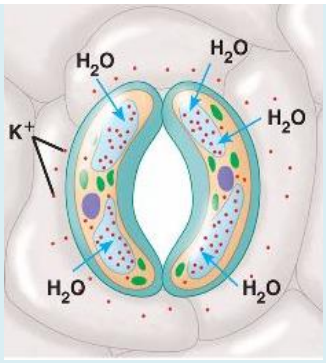
Figure 11- A and b) Gestalt Biology based on connected element- Characteristics of Life [11].

6.12. Symmetry: The human mind assumes the object to be symmetrical and expects to exist from the point to the centrality of the image. When the two symmetric elements are not related, the mind connects them to create a coherent design (Fig. 12. a-j)



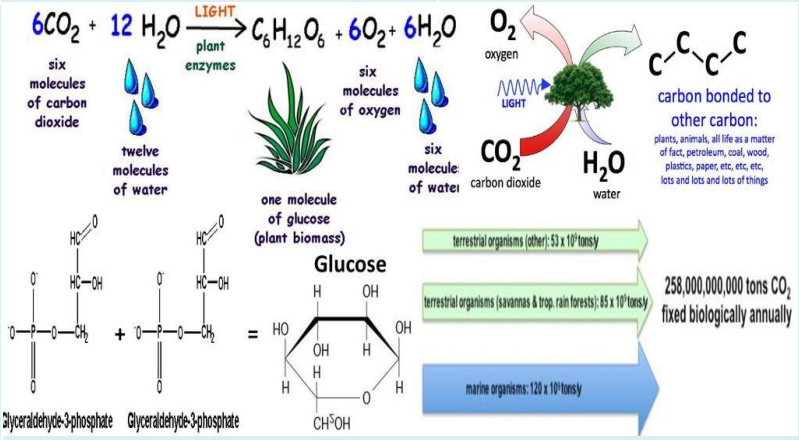
a) The kidney and super kidney of the human body symmetrically (in the above form we tend to understand a symmetric kidney and not two separate kidneys)

b) Symmetry of head components in rattlesley (in the shape above we tend to understand one eye and not 2 separate eyes).



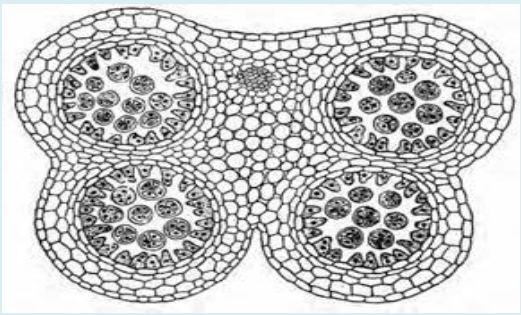
c) Amenthal guardian cells in the leaves of the plant (in the figure above we tend to understand a symmetric protective cell and not 2 separate cells).

d) In high shape we tend to understand a fish and not two separate fish dancing.



e) In photosynthesis reaction, inorganic carbon is converted into organic carbon.

f) Asymmetry in the thyroid gland (goiter disease)



J) Transverse slice of anesthis with four pollen cases

Figure 12- a-j) Gestalt Biology based on symmetry element- Characteristics of Life (Solomon, 2015)

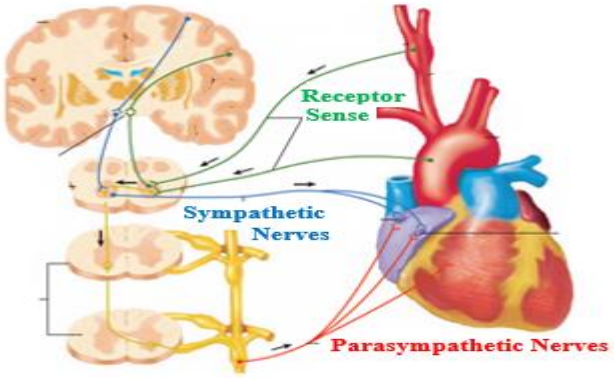
Table 1- Summary of the application of Gestalt principles and characteristics of life [14]

Symmetry	connected element	Common Region	Parallel	Common Destiny	relationships	Common.d	integration	Basdar	continuity	similarity	Contact	Near the edges	Gestalt principles Features of life
													order and arrangment
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Homeostasis
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Development
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Earn energy
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Reproduction
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Response to the environment
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Compatibility with the environment

7. Discussion

We examine the whole thing more than the community of its members about the circulatory apparatus. The circulatory system of substances in humans includes the heart, veins and blood (Fig. 13), and it is more than the community of organs and tissues that make up it, because the activity of other parts of the body, including digestive activity, breathing must also be in harmony with circulation. The activity of the device regulates circulation, like other parts of the body, nervous and hormonal devices. The nervous regulation of this device is performed by a part of the nervous system called the autonomous nervous system. The pacemaker node creates regular impulses and releases in the heart to repeat the heart rate regularly. Normally, this beat and the resulting cardiac exogenousity meets the oxygen and nutrient requirements of the body's organs. But when you exercise or at rest, the heart's exogenousity needs to be changed. Regulating the activity of the circulatory system is done with various mechanisms: 1) nervous system (sympathetic and parasympathetic nerves): The stimulation of sympathetic nerves spreading through the muscle cells of the ventricles increases the activity of the heart and reduces the stimulation of parasympathetic nerves attached to the nodes of the conductor network. Sympathetic nerves are also connected to the blood vessels of the kidneys, intestines, spleen and skin to tighten the blood vessels of these organs while working or stressed. The coordination center for these nerves is located in Besl al-Nakha and The Brain Bridge, near the respiratory regulation center, and the cooperation of these centers provides the body's need for nutrients and oxygen in certain conditions. Hormones: When we are tested in special stress situations such as worry, fear and stress, the secretion of some hormones from endocrine glands such as adrenal glands increases. These hormones increase blood pressure and heart rate by affecting some organs such as the heart, liver and kidney. 3) Local regulation of blood flow in tissues: carbon dioxide, potassium ions and hydrogen are vasodilation materials that, by affecting the

smooth muscles of the walls of the veins, dilate small arteries and open capillary cords to increase blood flow. The entry of some substances, such as calcium ions into the body fluids, also causes stenosis of the veins. Changing the amount of these substances in tissues causes local regulation of blood flow in tissues. 4) Reflective mechanisms for maintaining arterial pressure: Pressure receptors located in the walls of the general circulation arteries, as well as oxygen-deficient receptors and receptors sensitive to the increase in carbon dioxide and hydrogen ions, called chemical receptors, send messages to neural centers after stimulation to maintain normal arterial pressure, and meet the body's needs under certain conditions [1].



Sympathetic Nerves Parasympathetic Nerves Receptor Sense

Figure 13- Holistic in regulating human circulatory system activity [11].

8. Conclusion

The body's organs are more than the community of body organs and their tissues. For this reason, the characteristics of the system cannot be explained only through the study of its components, and the relationship between the components, such as the components themselves, is more than the sum of its components in the formation of the life-effective and the whole system. In general, the principles of Gestalt generalism, adjacent and symmetry provide stronger gestalt than other Gestalt principles in investigating some biological phenomena. In several cases, gestalt defects in a structure have led to disruption or disease. For example, the "principle of proximity in integration" is observed in the case of narrow intestinal folds, which increases nutrient absorption levels, in celiac disease due to gluten protein (which is found in wheat and barley) the intestinal cells are degraded and microplys and even v flaxseeds are destroyed. As a result, the level of absorption of substances decreases drasticly and many of the nutrients the body needs are not absorbed. Or in quaternary disease (abnormal thyroid growth) in a healthy person, this elapsed gland with butterfly symmetry is located in the front of the trachea, but in patients, asymmetry (growth of one part more than the other part) is observed. In addition, defense mechanisms, the action of enzymes,

hormones that play a key role in the continuation of life characteristics, have adjacent gestalt. In the case of cancerous tumors, overlap violations and non-overlapping structures have led to cancer. By comparing the basic model of Gestalt principles in the healthy part and exiting the Gestalt Pragmatics (perfectionism) of life, diseases can be identified based on bio-gestalt in a timely way and necessary corrective action can be taken. The characteristics of life (organisms) and the principles of Gestalt match, for example, the cells that form a tissue have both life characteristics and Gestalt principles.

9. Offer Considering that Gestalt's principles are expressions of the geometric characteristics of life that we have first explored in the form of biological phenomena, we propose a new expert system based on fuzzy logic and image processing algorithm for early diagnosis of diseases based on Gestalt and life principles

10. Thank you and thank you hereby to all those who helped us with this research.

Reference

[1] Al-Mohammad, Seyed Ali., Ebrahimi, Mohammad., Ansari, Maryam., Alavi, Elaheh., Gholami, Azam and Fakhrian, Bahman, Biology (3). Content planning and supervision of the writing office of general and secondary theoretical textbooks of the Ministry of Education, Research and Educational Planning Organization. Published: Tehran: Iran Textbooks Publishing Company, 2nd edition, 2019. 128p. [In Persian].

[2] Al-Mohammad, Seyed Ali., Ebrahimi, Mohammad., Ansari, Maryam., Alavi, Elaheh., Gholami, Azam and Fakhrian, Bahman, Biology (2). Content planning and supervision of the writing office of general and secondary theoretical textbooks of the Ministry of Education, Research and Educational Planning Organization. Published: Tehran: Iran Textbooks Publishing Company, 2019. 160p. [In Persian].

[3] Al-Mohammad, Seyed Ali., Ebrahimi, Mohammad., Ansari, Maryam., Alavi, Elaheh., Gholami, Azam and Fakhrian, Bahman, Biology (1). Content planning and supervision of the writing office of general and secondary theoretical textbooks of the Ministry of Education, Research and Educational Planning Organization. Published: Tehran: Iran Textbooks Publishing Company, 2019. 120p. [In Persian].

[4] E. Dondis, Donis, "Principles of Visual Literacy" Translated by Masoud Sepehr, 2nd edition, Tehran, Soroush, 1992. [In Persian].

[5] Bruno, FaranakJoo, "Descriptive Psychology Culture", Translated by Farzaneh Taheri, Tehran, Tod, 2007. [In Persian].

[6] Rezazadeh, Taher. (2008). Application of Gestalt The thee in Art and Design. [In Persian].

[7] Shapurian, Reza, "General Principles of Gestalt Psychology", Tehran, Tode Publications, 2007.

[8] Kaps, Georgy, "Picture Language", Translated by Firouzeh Mohajer, Tehran, Soroush, 2003.

[9] Laotzo, "Taoette Ching", Translated by Farshid Ghahhremani, Tehran, Triangle, 2008. [In Persian].

[10] Raven Peter, Mason Kenneth, Losos Jonathan, Singer Susan, Biology, 11th Edition, ,lliH warGcM 2017.

[11] John E. Hall, Guyton Roy R.Behrens, (2004), "Art,Design and Gestalt Theory", Leonardo Online [on-line].

[12] Solomon Eldera ,Berg Linda, Martin Diana, Biology, 10 Th Edition, Thomson, 2015.

[13] Taiz and Zeiger, Plant Physiology, 3th Edition, Sinauer Association, 2003.
[14] Torrans, Clare (1999), "Gestalt and Instructional Design", Edit 704, March 8.
[15] yazdanpanah, M., Karamizadeh, Sh., Tirband, M., (2020), The Provide a model based on Gestalt principles for predicting and analyzing the characteristics of life (organisms) provided: 7th International Conference Modern Research In Psychology, Counseling, And Educational Sciences, 17 November, Tbilisi-Geor