Gestalt psychology and his properties of perception

Gestalt theory originated in Austria and Germany as a reaction against the associationist and structural school`s atomistic orientation (an approach which fragmented experience into distinct and unrelated elements). Gestalt studies made use instead of phenomenology. This method, with a tradition going back to Johann Wolgang von Goethe, involves nothing more than the description of direct psychological experience, with no restrictions on what is permissible in the description. Gestalt psychology was in part an attempt to ad a humanistic dimension to what was considered a sterile approach to the scientific study of mental life.

Studied shape-oriented psychology is the study of psychic phenomena holistic nature, and using the method of introspection. Gestalt psychologists were significantly influenced by philosophical phenomenology and also were inspired by the discovery of the magnetic field. Shape psychology influenced primarily cognitive psychology, social psychology and then psychotherapy.

Gestalt psychology is a school of thought that looks at the human mind and behavior as a whole. School of psychology, that interprets phenomena as organized wholes rather than as aggregates of distinct parts, maintaining that the whole is greater than the sum of its parts.

The Gestalt effect refers to the form-forming capability of our senses, particularly with respect to the visual recognition of figures and whole forms instead of just a collection of simple lines and curves.

According to the school, understanding of psychological phenomena such as perceptual illusions could not be derived by merely isolating the elementary parts for analysis, because human perception may organize sensory stimuli

in any number of ways, making the whole different from the sum of the parts. Gestalt psychologists suggest that the events in the brain bear a structural correspondence to psychological events; indeed, it has been shown that steady electric currents in the brain correspond to structured perceptual events

Gestalt psychology was founded by German thinkers Max Wertheimer, Wolfgang Kohler, and Kurt Koffka and focused on how people interpret the world. The Gestalt perspective formed partially as a response to the structuralism of Wilhelm Wundt, who focused on breaking down mental events and experiences to the smallest elements. Max Wertheimer noted that rapid sequences of perceptual events, such as rows of flashing lights, create the illusion of motion even when there is none. This is known as the phi phenomenon. Motion pictures are based upon this principle, with a series of still images appearing in rapid succession to form a seamless visual experience.[1]

The Gestalt Properties of Perception

One of the most formidable obstacles facing computational models of the perceptual process is that perception exhibits certain global Gestalt properties such as emergence, reification, multistability, and invariance that are difficult to account for either neurophysiologically, or even in computational terms such as computer algorithms. The ubiquity of these properties in all aspects of perception, as well as their pre attentive nature suggests that Gestalt phenomena are fundamental to the nature of the perceptual mechanism.[2]

Emergence

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The dog picture is familiar in vision circles for it demonstrates the principle of emergence in perception. For those who have never seen this picture before, it appears initially as a random pattern of irregular shapes. A remarkable transformation is observed in this percept as soon as one recognizes the subject of the picture as a dalmatian dog in patchy sunlight in the shade of overhanging trees. What is remarkable about this percept is that the dog is perceived so vividly despite the fact that much of its perimeter is missing. Furthermore, visual edges which form a part of the perimeter of the dog are locally indistinguishable from other less significant edges. Therefore any local portion of this image does not contain the information necessary to distinguish significant from insignificant edges.

Reification

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Figure A, is one of the most familiar illusions introduced by Gestalt theory. In this figure the triangular configuration is not only recognized as being present in the image, but that triangle is filled-in perceptually, producing visual edges in places where no edges are present in the input, and those edges in turn are observed to bound a uniform triangular region that is brighter than the white background of the figure. In Figure B through D, in which the illusory percept takes the form of a three-dimensional volume. These figures demonstrate that the visual system performs a perceptual reification. The identification of this generative aspect of perception was one of the most significant contributions of Gestalt theory.

Multistability

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A familiar example of multistability in perception is seen in the Necker cube. Prolonged viewing of this stimulus results in spontaneous reversals, in which the entire percept is observed to invert in depth. Even more compelling examples of multistability are seen in surrealistic paintings by Salvator Dali, and etchings by Escher, in which large and complex regions of the image are seen to invert perceptually, losing all resemblance to their former appearance.

Drawing Hands

Drawing Hands (M. C. Escher)

It depicts a sheet of paper out of which rise, from wrists that remain flat on the page, two hands, facing each other and in the paradoxical act of drawing one another into existence. Although Escher used paradoxes in his works often, this is one of the most obvious examples.[6]

Relativity

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Relativity (M. C. Escher)

It depicts a world in which the normal laws of gravity do not apply. The architectural structure seems to be the centre of an idyllic community, with most of its inhabitants casually going about their ordinary business, such as dining. There are windows and doorways leading to park-like outdoor

settings. Yet all the figures are dressed in identical attire and have featureless bulb-shaped heads. Identical characters such as these can be found in many other Escher works.

In the world of Relativity, there are actually three sources of gravity, each being orthogonal to the two others. Each inhabitant lives in one of the gravity wells, where normal physical laws apply. There are sixteen characters, spread between each gravity source. The apparent confusion of the lithograph print comes from the fact that the three gravity sources are depicted in the same space.[8]

Invariance

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A central focus of Gestalt theory was the issue of invariance, i. e. how an object, like a square or a triangle, can be recognized regardless of its rotation, translation, or scale, or whatever its contrast polarity against the background, or whether it is depicted solid or in outline form, or whether it is defined in terms of texture, motion, or binocular disparity.

For example, the objects in A in the figure are all immediately recognized as the same basic shape, which are immediately distinguishable from the forms in B. They are even recognized despite perspective and elastic deformations as in C, and when depicted using different graphic elements as in D.

Gestalt Laws of Perceptual Organization

Series of lights often appears to be moving, such as neon signs or strands of Christmas lights. According to Gestalt psychology, this apparent movement

happens because our minds fill in missing information. This belief that the whole is greater that the sum of the individual parts led to the discovery of several different phenomena, that occur during perception.

According to Gestalt psychology, the whole is different than the sum of its parts. Based upon this belief, Gestalt psychologists developed a set of principles to explain perceptual organization, of how smaller objects are grouped to form larger ones. These principles are often referred to as the “ laws of perceptual organization”.

However, it is important to note that while Gestalt psychologists call these phenomena “ laws”, a more accurate term would be “ principles of perceptual organization”. These principles are much like heuristics, which are mental shortcuts for solving problems.

Law of Similarity

The Law of Similarity holds that things which are similar in some way appear to be grouped together. Grouping can occur in both visual and auditory stimuli.

Items that are similar tend to be grouped together. In the image above most people see vertical columns of circles and squares.

Law of Pragnanz

The word pragnanz is a German term meaning “ good figure”. The law of Pragnanz is sometimes referred to as the law of good figure or the law of

simplicity. This law holds that objects in the environment are seen in a way that makes as simple as possible.

Reality is organized or reduced to the simplest form possible.

For example, we see the image above as a series of circles rather than as many much more complicated shapes.

Law of Proximity

According to the law of proximity, things that are near each other seem to be grouped together.

The circles on the left appear to be grouped in vertical columns, while those on the right appear to be grouped in horizontal rows.

Law of continuity

The Law of continuity holds that points that are connected by straight or curving lines are seen in a way that follows the smoothest path. Rather that seeing separate, lines and angles, lines are seen as belonging together.

In the image above, the top branch is seen as continuing the first segment of the line. This allows us to see things as flowing smoothly without breaking lines up into multiple parts.

Law of Closure

According to the law of closure, things are grouped together if they seem to complete some entity. Our minds often ignore contradictory information and fills in gaps in information.

Objects grouped together are seen as a whole.

We tend to ignore gaps and complete contour lines. In the image above, there are no triangles or circles, but our minds fill in the missing information to create familiar shapers and images.

The Law of Common Fate

The law of common fate states that when object move in the same direction, we tend to see them as a unit.

When dots 1, 3 and 5 moves down and dots 2 and 4 move up at the same time, the dots moving in the same direction are perceived as a group.

Gestalt grouping laws do not seem to act independently. Instead, they appear to influence each other, so that the final perception is a combination of all of the Gestalt grouping laws acting together. Gestalt theory applies to all aspects of human learning, although it applies most directly to perception n and problem-solving.

Gestalt views in psychology

Gestalt views of psychopathology are almost completely ignored in mainstream psychology and psychiatry. However, a review of available evidence indicates a remarkable consistency between these views and current data from experimental psychopathology and cognitive

neuroscience. This consistency is especially pronounced in the area of schizophrenia. In addition, there is a convergence of cognitive neuroscience. This consistency is especially pronounced in the area of schizophrenia. In addition, there is a convergence of cognitive and neurobiological evidence regarding the validity of early Gestalt views of both normal brain-behavior relationships and disordered ones, as in schizophrenia. Gestalt theory is a viable theoretical framework from which to understand schizophrenia. Specifically, it appears that a breakdown of Gestalt organizational processes may characterize both the cognitive and the brain processes in schizophrenia.[10]

Hermann grid

On the picture is not any dark points. If for some focusing attention a and disappear. Why do you see the points? Imagine two areas in your retina. The first sees the “ crossroads” of horizontal and vertical white lines. The place where you can see those points. The second part sees the white lines on both sides constricted black square-line “ crossroads”. Although both areas receive the same amount of light, so the first area (intersection) has a bright side area just two parties – the other two sides are bum black squares. In this situation, the physiological mechanism works called “ lateral inhibition”, which causes the dark area around the area make perceived as clearer and bright surroundings made perceivable as a darker area. What is the physiological explanation? The retina is made up of “ grid” stacked next to the sensors respond to light. If sensor is galvanizing (light falls on it) and sends a signal intensity. There are two situations. In both situations, it is used as a strong light. In the first situation is illuminated probe A plus

additional sensor placed next to him. Although in both situations is used as an intense light, and in the second position sensor and sends a weaker signal – is suppressed surrounding sensors, which were also galvanizing. Sensor signal is suppressed, where sensors located in its vicinity also broadcast signals. In our case, we first area is mor suppressed, because it has more surrounding light areas (and thus have sensors around the intersection of perceiving themselves more active sensor), and therefore we see it as darker than the white areas between intersections that have less surrounding light areas (only two pages) and hence less surrounding sensors, which would suppress sensor perceiving these areas. This mechanism is called lateral suppression, because it uses the transmission of nerve signals structure called “ lateral plexus”

Conclusion

Gestalt psychology is a school of thought that looks at the human mind and behavior as a whole.

The Gestalt effect refers to the form-forming capability of our senses, particularly with respect to the visual recognition of figures and whole forms instead of just a collection of simple lines and curves.

According to Gestalt psychology, the whole is different than the sum of its parts. Gestalt psychologists developed a set of principles to explain perceptual organization. These principles are often referred to as the “ laws of perceptual organization.”

Law of Similarity, Law of Proximity, Law of Symmetry, Law of Continuity, Law of Common Fate, Law of Pragnanz.

The key principles of Gestalt systems are: Emergence, Reification, Multistability, Invariance

For visual experience is more than just an abstract recognition of the features present in the visual field, but those features are vividly experienced as solid three-dimensional objects, bounded by colored surfaces, embedded in a spatial void. eg. In the world of Relativity, there are actually three sources of gravity.

The modern view is that mind and brain are different aspects of the same physical mechanism.