

GESTALT THEORY

Gestalt psychology is the study of the behavior of animals in their environment. The environment is both physical and social; behavior is physical, emotional and social. Architecture is part of the physical environment, but from the gestalt point of view, it evokes physical, social, and emotional responses. Gestalt psychology covers the behavior of all animals; however, in this work any quote or reference to animal behavior refers to human behavior.

There are three primary figures in the field of gestalt psychology: Max Wertheimer, Wolfgang Kohler, and Kurt Koffka. They tend to quote each other's works and experiments, though Kurt Koffka also substantiates many of his hypotheses with a wide variety of experiments by lesser-known gestalt psychologists. Both Koffka and Kohler credit Wertheimer for identifying the principles of grouping and formulating the concept of isomorphism. Wertheimer's principle works are in German; therefore the descriptions of these concepts will be from Kohler's and Koffka's works in English.

Basic Design and Graphic Design have tended to emphasize the gestalt laws as two dimensional phenomena, and this has affected architectural thinking. However, the environment is three dimensional, and gestalt psychologists are primarily interested in explaining behavior in terms of this environment. The confusion between the design applications and experiments is reasonable because most gestalt experiments have utilized two dimensional presentations to isolate a phenomena even though it is, in the final analysis, assumed to be a part of a larger framework in which its value is relative to the framework and other events within it. As Koffka states, "our hypothesis claims that three-dimensional shapes are matters of organization in the same way as two-dimensional ones, depending on the same kind of laws."¹

There are, in gestalt psychology, several primary hypotheses that relate to the perception of three-dimensional environments. They are hypotheses concerning the relation between what is real and what is perceived, the nature of gestalts, the behavior of gestalts formulated into the Law of Pragnanz, the principles of grouping, the reality of the Ego, processes of learning, including the concept that meaning is an overlay of form perception, and finally, hypotheses concerning the formation and cohesion in and among societies.

The first conceptual problem gestalt psychologists address is whether what we see is real or subjective. Kohler identifies our initial reaction to things when he says, "our naive

experience consists first of all of objects, their properties and changes, which appear to exist and to happen quite independently of us."² We experience an ordered environment that responds to physical and social laws and relationships. Is this environment real or subjective?

The simple truth is that some of the experiences which depend upon processes in any organism have the character of objectivity, whereas others which depend upon different processes in the same organism have the character of being subjective. This contrast has nothing to do with the generic subjectivity of both types of experience, i.e., with the fact that both depend upon events within the organism.³

To account for this subjectivity, the Gestaltists hypothesize a relationship between the geographical environment the real environment, and what Koffka calls our behavioral environment or that which we perceive. Wertheimer's solution is the theory of isomorphism. This theory postulates that the real and behavioral worlds are similar; however, order is a property of perception, the behavioral environment, and not necessarily the real environment. Gestaltists contend that for us to function there has to be a high correlation between the real and the behavioral environment. The differences between the two are of great significance, although theoretically we can never know the magnitude of these differences or if in fact they actually exist. A simple example to demonstrate the hypothesis of isomorphism would be two people looking at a bowl of oranges. It is believed that both the people and oranges exist and both people's perceptual systems see oranges. There is an isomorphic relation between the real world bowl of oranges and the image of oranges on which their perceptual system operates. What proof one can have of isomorphism is that the people can reach for the oranges and expect to be able to grasp them. However, one of the people viewing the bowl might feel the oranges make a pleasurable stillife that is well-composed in its context. This experience is not so much an aspect of the geographical environment, but is primarily part of the behavioral environment. The pleasant experience might not be shared by both people and, in a more critical example, it could be detrimental to assume that both viewers are experiencing the same thing. Koffka says that, "the results of the animal's behavior depends not only on his behavioural but also on his geographical environment," and that we as animals, "can explore directly only our behavioural environment, and indirectly merely, through the behavioural, the geographical one."⁴ He goes on to say we can be attracted to or repelled from things in our environment, but that these forces of attraction or repulsion only occur in the behavioral environment, not in the geographic one.

Visual perception depends on light which gestaltists say stimulates the retina and, "as far as retinal stimulation is concerned, there is no organization, no segregation of specific units of groups."⁵ We do see order; "thus in countless instances sensory organization means a reconstruction of such aspects of physical situations as are lost in the wave messages which impinge upon the retina."⁶ In other words, the order in the environment that is lost in the transmission by light to our retina needs to be reconstructed to be interpreted. The reconstruction is the behavioral environment, not a one-to-one map of the order in the view.

This reconstruction and organization of information is into gestalts. A gestalt is a form, a shape, an ordered whole which may refer in Gestalt psychology to ideas learned, emotions, needs, attitudes, social structure, as well as physical organizations. Gestalts are attributes of our behavioral environment. Gestalts have varying degrees of internal cohesion and strength of relation to other gestalts and to their background.

The basic gestalt experience is that of a figure and its background. The minimal visual stimulation is an undifferentiated, unfocusable fog. Koffka says that, "we must further conclude that homogeneous tri-dimensionality, the fog, is a simple effect, the simplest of which our sense of sight is capable."⁷ Gestalts are formations of order in this fog and they possess forces in the behavioral environment. "To see a surface is...the effect of a higher degree of organization, presupposing special forces."⁸ These forces are said to hold the figure in equilibrium by balancing the forces of the field which impinge upon it. These forces are thought to be similar to physical forces, but have never been clearly defined and documented.⁹

From this base, the first Gestalt Law of Figure/Ground derives. Koffka called this the Law of Unit Formation and Segregation and said "the equality of stimulation produces forces of cohesion, inequality of stimulation forces of segregation, provided that the inequality entails an abrupt change."¹⁰ The Figure/Ground relationship exhibits two tendencies; one representing movement toward the minimum organization (ground) and one toward the maximum organization (figure formation). The forces attributed to figure formation and other gestalts such as emotions are thought to be similar to physical forces. The best example given is that of a drop of water on a smooth surface such as a car hood; the surface tension of the water causes a rounded form, taking its shape from a balance of internal and external forces. In a similar fashion, figural objects are said to have internal forces of cohesion and are restrained by forces of the ground, all tending toward equilibrium. Koffka says,

In our psychophysical case, then, we have two kinds of forces, those which exist within the process in distribution itself and which will tend to impress on this distribution the simplest possible shape, and those between the distribution and the stimulus pattern, which constrain this stress towards simplification.¹¹

The concept of balance and equilibrium of forces gave rise to the most general principle of gestalt, the Law of Pragnanz, which was formulated by Wertheimer. As Koffka describes the Law of Pragnanz, "psychological organization will always be as 'good' as the prevailing conditions allow,"¹² "Good" generally refers to regularity, symmetry, simplicity, an equilibrium among things. This end state of equilibrium and simplicity is approached from the balance of inward and outward forces. Since these forces are considered to be part of one's own internal ordering of events, they are dynamic and their function is to clarify a visual field or social event or both.

This concept of forces of attraction and repulsion is also fundamental to the principles of grouping. When several objects are perceived, they are grouped on the basis of several relationships that they exhibit in the behavioral environment. These relationships are said to represent forces similar to those that provide cohesion to a figure, and they act in three-dimensions as well as in the experimental world of two-dimensions. Kohler writes that, "Wertheimer was the first to recognize the fundamental importance of spontaneous grouping in sensory fields. He showed by many examples what principles the grouping followed."¹³

The principles he identified were grouping by proximity, similarity, good continuation, closure, and familiarity. Grouping by proximity is self-explanatory, but it is interesting to note that the closer two objects come to each other, the stronger the relationship between the two becomes. Grouping by similarity can be in terms of any or all attributes of an object, such as size, shape, color, texture, location in a subset, or emotional value to the individual. Although good continuation usually refers to lines, in architecture it refers to alignment; objects are said to group by alignment. This idea is intimately tied to grouping by proximity as well. Grouping by alignment is reinforced by proximity; the grouping of the sills of two windows, if close, is stronger than the same alignment at a greater distance. Flowing curves are said to exhibit directional force in line with the flow, and continuity can be developed in alignment of interrupted flow as well as straight lines. Grouping by closure is usually represented by a drawn circle with a segment missing; the force of good continuation would seem to close the figure. In three-dimensional space, such as a medieval urban space, the

force of closure blends the small spaces between the surrounding buildings to give the space a sense of the interior of a container. In essence, it would be tending toward a simpler form. The last grouping, grouping by familiarity, is also self-explanatory; similar familiar objects simply group, for instance oranges.

All these aspects of forms have relative relationships to each other. Things can be more or less similar to each other, closer or further away from each other. Recognizable groups of objects are held in a balanced state by the forces in the behavioral environment that provide the order we see. Koffka points out that on "the problem of perceived form we must conclude that the shape of our ink blot or of any other figure is the result of forces which do not only segregate the figure from the rest of the field, but hold it in equilibrium with the field."¹⁴

Hierarchies among the gestalt characteristics of a group of objects can be identified, but the evaluation is relative to the situation observed. There is no basic hierarchy of gestalts; each situation depends on the intensity of particular characteristics and their relative strength in relation to other gestalt characteristics. Hierarchies in the strength of gestalt relationships are important in composition and comprehension because they define what is seen and in what order. Think of a small fishing village. The houses are generally similar in size, shape, color and texture. They tend to group visually and to be read collectively from a distance. The church, however, might separate itself by being larger and more formally composed. Because of its stronger internal gestalts and greater scale contrast with its context, it is seen first and it dominates the composition and visual organization of the entire village. While there is an internal hierarchy in the view, the entire village is considered to be visually balanced by counteracting forces in the behavioral environment (visual/mental apparatus), which are not present in the geographic environment. Because of the varying strengths of the gestalts in this view it is assumed that the composition will only be seen in this one way. The church, strongly organized and of greater contrast to its context than an individual house, will always dominate. (fig. 1)

This example also illustrates the contention that there can be nesting gestalts. The church facade has an internal cohesion based on symmetry and similarity of forms which forms a composition within the larger composition of the village view. It exhibits more and stronger gestalt relationships than the average house and is therefore quickly recognizable and more stable compositionally.

The relativity of visual order can be illustrated by comparing two villages, one with a church in the center painted the same color as the houses and one with a church on a hill some distance from the village, the church painted in a contrasting color to the village. The first village seems to order around the church because it is within the village and is similar in color while only contrasting in scale. The other village and church exhibit two organizations with few interrelationships between the church and houses, but many within the church composition itself and within the village composition itself. The first village will seem more integrated than the second because of the relative strength of the gestalt relationships between the church and housing. The Law of Pragnanz suggests that it is simpler to see the first example as one composition while the second, because of the strength of the internal gestalt relationships in the church and town, and the weak relation of simple proximity between the two, would be seen as two separate compositions.

Gestalt characteristics tend to relate objects together, but they can also be used for differentiation. Kohler's example is the sense of grouping in ornaments, such as Sullivan's terracotta work, a homogeneous material. "In countless cases organization is a sensory fact when there is no corresponding physical unit."¹⁵ In this example, light and shadow and linework produce patterns that exhibit strong gestalts within one object.

Since the gestalt relationships enumerated so far deal primarily with physical relationships, it should be clear that architectural composition can be manipulated to express desired relationships and sublimate undesirable ones, and that this expression can exhibit relative levels of clarity which can provide emphasis to parts of a composition.

The strength of the gestalt character is defined by Kohler by the degree of interdependence of the parts. The stronger the gestalt, the more will each of its parts depend on all the others, and the more will this dependence affect every aspect of the parts.¹⁶

Things and situations will appear as simple, balanced, and ordered as possible; if there is an imbalance, it stimulates action to bring greater order and stability to a situation. In discussing form, Koffka says,

Good continuation and good shape were powerful organizing factors, and both were in the true sense 'understandable:' a line carries its own law within itself, and so does a shaped area or volume. Violations of this law due to external forces are felt as violations; they conflict with our feeling of the fit, hurt our sense of beauty.¹⁷

Thus far, this description of gestalt psychology has dealt with forces within the behavioral environment that provide order to the visual stimuli. However, it became clear to the Gestalt psychologists that order is not simply an aspect of the physical relationships of things, but is also affected by attitudes, and attitudes require a place to reside. Therefore, the Gestaltists hypothesize the existence of a Freudian ego. Koffka states:

In the first place, we find the field organization under certain circumstances dependent upon attitudes, i.e., forces which have their origins not in the surrounding field at all, but in the Ego of the observer, a new indication that our task of investigating the surrounding field alone is somewhat artificial, and that we shall understand its organization completely only when we study the total field which includes the Ego within its environment.¹⁸

The Ego is the self and is said to behave like any other segregated object in the field except that, as a rule, it is more or less in the center of the behavioral environment. Koffka states,

For in all changes of the behavioural field the Ego remains as a segregated part. The segregation will not proceed along the same boundary lines all the time, it will not invariably be of the same strength, and the relative importance of the Ego in the field will change. Still the Ego within the total field seems comparable to the physical organism in its geographical environment. Both are strongly organized stable sub-systems within a larger system, and just as in all changes the organism maintains its identity and thereby produces its growth and development, so will the Ego grow and develop by maintaining itself in the flux of the behavioural environment, or more generally of the psychophysical field. And the study of action as conduct is just the study of the continuous process of balancing the Ego sub-system in the total field.¹⁹

In this description, the Ego is a stable entity that can expand or contract and exerts force on the interpretation of objects and events in the behavioral environment. An Ego can expand outside the physical self, as in the case of one's home or children, as a projection, to some degree, of the person. Koffka says, "forces originating in the Ego can exert an influence on the behavioural environment of the Ego by influencing its organization."²⁰ These forces are considered to originate in the needs or quasi-needs of the Ego, and are reflected in attitudes toward things and situations.

Another aspect of the relation of people to their environment is the concept of a framework of reference for the Ego. This concept says that objects are seen in relation to more stable frameworks. In describing real and imagined motion, Koffka writes,

We fall back on our distinction of things and framework and our knowledge that the framework is more stable than the things within it. If we apply this to the case of motion we must deduce the following proposition: if one of the two field objects has the function of framework for the other, then it will be seen at rest and the other as moving no matter which of the two moves in reality.²¹

At this point, the description of Gestalt Psychology has covered the organization of the visual field, the concept of framework or reference system, and the supposition of the Ego. The next issues to address are how and why people learn and the relation of emotions to things. But before this, it is important to note that the gestaltists believe that organized wholes are perceived first, and then acquire meaning. Kohler states,

Gestalt Psychology holds, sensory units have acquired names, have become richly symbolic, and are now known to have certain practical uses, while nevertheless they have existed as units before any of these further facts were added. Gestalt Psychology claims that it is precisely the original segregation of circumscribed wholes which makes it possible for the sensory world to appear so utterly imbued with meaning to the adult; for, in its gradual entrance into the sensory field, meaning follows the lines drawn by natural organization; it usually enters into segregated wholes.²²

Imagine, for a moment, an infant's behavioral world held stable by a balance of forces of the ego and objects that look organized. This represents a field of forces in the brain, presumably chemical and electrical, that define the behavioral environment. This field can be imagined as a layered or three-dimensional field with cohesive parts that segregate themselves from, as well as relate to, other segregated parts of the field. The segregations can be strong or weak depending on what they represent and how they have been reinforced through learning into forming stronger gestalts. Learning is the interaction between objects and the ego that changes and strengthens the gestalt of the object or ego or both. The learning process is a process of permanent change of the gestalt of an object or situation toward a more balanced meaningful whole. The infant grows by interacting with the environment and

learning. The infant's brain field organizes into stronger and stronger gestalts. Gestalts can be nested hierarchically or cluster to form larger whole organizations, all dependent on the Ego interacting with the environment.

The meaning of objects changes through use. Koffka states, "the use of an object means it has undergone a permanent change of organization, by virtue of which it is no longer an Ego-independent thing, . . . but a thing with a permanent relation to the Ego."²³ For example, a tool such as a computer has vague implications to an individual who does not use one. Upon repeated use its abilities and limitations become clear and it can no longer be thought of again in a vague way. It is the same object with a new understanding of it, but the understanding and object are inseparable. The designer of the machine has an even greater knowledge of it which is again different from that of the user and is not interchangeable with the user's knowledge. To each individual the object is perceived slight differently, while in the geographic environment it is the same object.

Activity or Ego interaction with the environment leaves what are called traces in the mental field. These traces form gestalts or segregated organizations in the field. "Learning, as the modification of an accomplishment in a certain direction, consists in creating trace systems (in the field) of a particular kind, in consolidating them, and in making them more and more available both in repeated and in new situations."²⁴ Memory is simply the trace left in the field of a strong gestalt; the stronger the gestalt the more easily it is remembered and related to its next larger whole. The field becomes articulated and "articulate organization has two aspects. In the first place the individual trace may be more or less articulate, in the second the trace may be more or less articulate and significant part in one of several larger trace systems."²⁵

To return to the computer example, a strong gestalt of the computer at hand is developed through use, while at the same time, it is part of one or more larger conceptual organizations which are gestalts in themselves. For example, the computer could be part of the definition of one's job or it may be part of a classification of many computers with differing capabilities.

The idea that Ego interaction with the behavioral environment changes the meaning of things has interesting architectural implications. First, Koffka contends that emotions are states of the Ego system, and a "feeling of happy satisfacton corresponds to a psychophysical field at a lower level of tension and of greater stability."²⁶ This implies a strong visual order; i.e. stable configurations will produce a

satisfying experience. Secondly, since meaning is learned and part of an ego-environment interaction which changes the meaning of the environment, an environment can be said to embody emotional meanings, such as sadness or happiness, depending on the gestalt a particular social and physical environment formed in the memory of an individual. It should be remembered that Gestalt Psychology hypothesized the behavioral environment as distinct from the geographic environment but related the two through the concept of isomorphism. Emotions relate to the behavioral environment and not the geographical environment, but they are definitely real to the individual. They are formed by the interaction of the Ego with the environment and can be biased by attention to particular details. A simple example is that of having a car accident at a particular location. The accident produces a trauma which becomes part of memory and the location takes on all the meanings associated with the accident. The place and experience are inseparable.

Social structures are said to exert similar forces on the individual that must be brought into equilibrium with the ego. Educational systems bring culturally organized systems to the individual to learn and accept. Koffka suggests that some social structures act as barriers for ego development and expression. He says: "In ordinary life customs, manners, and morals will often constitute such external barriers."²⁷

These barriers are gestalts which can be accepted, thus minimizing tension, or balanced and changed by the will of the Ego. Architecture, as all other fields, is influenced by the attitudes and methods of both the larger society and the professional sub-group, including its educators and educational institutions. From the Gestalt point of view, change in the order and meaning of architecture would be difficult to accomplish because it requires a change in collective beliefs and institutions, as well as in the individual. These changes require a great deal of energy. As Koffka says, "articulations of a highly complex kind can be produced only under special conditions, when the organism, through its 'attitude,' supplies part of the effective forces and an ample store of energy."²⁸

In conclusion, if gestalt theories are accepted by architects, they require an understanding of gestalt relationships that include physical order as well as both individual and societal conceptual orders that have great influence on the interpretation of the environment. Gestalt psychology contends that these aspects of interpretation can be quite clear and unambiguous within a context, at least in formal terms and probably in societal and individual terms as well. This then provides the framework for clear communication between an architect and the public through building form.

Footnotes & Illustrations

1 Kurt Koffka, Principles of Gestalt Psychology, (New York: Harcourt, Brace and Company, 1935) p. 161.

2 Wolfgang Kohler, Gestalt Psychology, (New York: Liveright Publishing Corporation, 1947) p. 5.

3 Ibid., p. 24.

4 Koffka, p. 4.

5 Kohler, p. 162.

6 Ibid., p. 163.

7 Koffka, p. 116.

8 Ibid., p. 117.

9 It is not the intention of this work to criticize the theories presented, but it should be noted that the Law of Pragnanz and the general idea of force have been identified as the least well-documented aspects of Gestalt theory. Such criticisms can be found in:

W.C.H. Prentice, "The Systematic Psychology of Wolfgang Kohler," in Psychology: A Study of a Science, ed. Sigmund Koch (New York: McGraw Hill, 1959).

and

Benjamin Wolman, Contemporary Theories and Systems in Psychology, (New York: Plenum Press, 1981), p. 456.

10 Koffka, p. 126.

11 Ibid., p. 138.

12 Ibid., p. 110.

13 Kohler, p. 144.

14 Koffka, p. 132.

15 Kohler, p. 157.

16 Koffka, p. 650.

17 Ibid., p. 175.

- 18 Ibid., p. 149.
- 19 Ibid., p. 331.
- 20 Ibid., p. 398.
- 21 Ibid., p. 282.
- 22 Kohler, p. 139.
- 23 Koffka, p. 393.
- 24 Ibid., p. 544.
- 25 Ibid., p. 544.
- 26 Ibid., p. 402.
- 27 Ibid., p. 424.
- 28 Ibid., p. 508.

Illustrations



1 Church Form
Dominating Village