COMPARISON OF THEORIES
AND THEIR ARCHITECTURAL EDUCATIONAL IMPLICATIONS

The comparison of the design theories with the theories in
the psychology of perception is complex and revealing. The
complexity arises from differences in methodology and intention
between architectural theory and psychology. It is also due to
the fact that neither architectural theory or the psychology of
perception is singular and monolithic. Within each field there
are major differences which will be brought out to reveal the
surprising breadth of interpretation these differences make
possible.

At a fundamental level, architectural theory and psychology
differ in what constitutes a rational justification and test of
a concept. In psychology, a plausible hypothesis is formulated
and its validity is tested through the scientific method;
arbitrary theory justifies its concepts by relying heavily
on historic precedent and bits and pieces of philosophy and
science. In the two design theories examined in this work,
scientific experimentation was never utilized to substantiate a
concept.

The second fundamental difference between the fields is that
of intent. The psychology of perception tries to explain how
people perceive their general environment while underlying most
design theories is the artistic intention of perfect
expression. Artistic appreciation is usually handled, if at
all, in psychology is a special condition and experience and not
as the norm. The two psychological theories under discussion
say very little about interpreting art.

Neither of these fundamental differences can be said to be
unimportant. However, the intent of this research has not been
to validate the methodologies of either field or to accept one
over the other. It is simply to suggest that some parts of
architectural theories can be supported by one or both of the
psychological theories and that this might have some effect on
the training of architects.

The issues become even more complex when, as has been done
in this case, the design theories are carefully analyzed. Not
only are there major differences between the design theories of
the Beaux-Art and the Modern Movement, but the Modern Movement
itself has three distinct conceptual forms. There is a formal
strain to some of the theories of the Modern Movement,
particularly those of LeCorbusier, that are, in many ways, quite
similar to formal concepts of the Beaux-Arts. There is a
diametrically opposed strain which is represented by the ideas
of Organic Architecture championed by such greats as Wright and
Aalto. And finally, there is a philosophy of problem solving instigated at the Bauhaus under Gropius which has interesting components of both attitudes and yet has distinct characteristics of its own. These differences are delineated in detail in the preceding sections. The reader need not let these distinctions be confusing. In general, the comparison will state which of these attitudes within the Modern Movement are being discussed.

The last complication introduced in this work is that the psychological theories also differ fundamentally with each other. They have differing rationales for the process of perception and therefore they support differing interpretations of the significance of components of the design theories. These differences are most apparent in the influence of symbols on perception, to be elaborated upon in the comparison. The most surprising commonality is that both support the concept of 'man as the measure,' though for very different reasons. This will be elaborated upon in the section on hierarchy.

All this complexity has the positive objective and value of providing greater insight into the relation between design theory and the psychology of perception. It is not necessary or recommended for the reader to try to come away with a clear prescriptive method for selecting an appropriate design theory. Instead, this work supports the idea that there are many appropriate design strategies, any of which might be valid in a particular context.

To deal with this complexity, the comparison has seven primary sections and several sub-headings. The first four sections follow the structure used to organize the architectural theories of both the Modern Movement and the Ecole des Beaux-Arts, the categories of geometry, hierarchy, mood or tone, and explicit symbol. The fifth section is an evaluation of the psychological theories, and the sixth formulates the implications of this comparison for architectural education. The final section is a summary.

Geometry

Geometry refers to patterning of architectural plans, elevations, sections and solid form, which usually, but not always, follow regular geometric shapes. Geometry, in this instance, should not be considered as an abstract mathematical science of points, lines and planes, but instead as dealing with the selection and allocation of building elements in patterns that relate to each other.
Platonic Form

The idea that there is a truth greater than a mathematical clarity in simple geometry is an architectural concept. The Vitruvian image of a man within a circle and square has represented the idealized relationship between human proportion and basic geometries for centuries and has been the genesis of many elegant designs. The idealized truth embedded in this drawing is that the clarity and simplicity in geometry is within human form and proportioning. It begins to define human beauty and compositional beauty as resting on the idea that a geometric truth is somehow a key to the laws of an inherently beautiful nature.

Gestalt theory would support Beaux-Arts and Modern Movement formalists in their assertion that primary forms are visually dominant. However, the Gestalt contention that form tends to be interpreted as being as 'good' (symmetric, simple, balanced) as the situation allows, is not the same as the value judgement the design theories place on the significance of primary forms. Good is a description of clarity and ease of recognition in Gestalt psychology; the design theories have interpreted primary forms as having elementary significance to the viewer. In some instances the rationale has been that primary forms symbolize a mathematical truth, a religious unity, and a natural law which can be intellectually appreciated as well as felt.

The Ecological approach would dismiss these ideas. They are not conceivable within a reality that perceives form from a flowing visual array of changing, not static, patterns nor do they take into account the exceptional performance capability of the perceptual system exhibited even in the most mundane human activities. From this view, simple configurations may be easily understood but are not therefore 'better' than complex configurations. The latter have the capability to sustain layers of significance. Nor is it clear that complex configurations are at all more difficult to perceive in an operational sense. There are, of course, levels of clarity in the environment, but the Ecological theory would suggest that it is not, for example, more difficult to perceive a place in a public park than the pure geometry of a racquetball court.

The other argument against a special significance of primary forms from the Ecological view is that most objects are not seen in a pure projection, but from an oblique angle, accompanied by motion and perspective distortion. This would make the view of platonic solids as complex as the view of many other objects and therefore difficult to distinguish, as shapes, from other relatively simple forms. In contrast, Gestalt theory is that through mental processes objects are geometrically rectified to a frontal view as part of recognition, and therefore it is quite possible to recognize pure geometries from other forms. If this
is the case, which the Ecological theory specifically contends is not, then platonic solids are easily recognized for their strong gestalt and can dominate a view.

Bauhaus Exercises

Basic Design exercises of the Bauhaus and later dealing with geometric shapes and platonic solids were based on contemporaneous theories in science, art, and education which contended that form was built from these elemental pieces and could be broken down into them for study. This idea is not supported by either psychological theory. Gestalt theory simply contends that if there are two ways of interpreting a composition, the simpler, in terms of gestalt groupings, will be utilized. This does not suggest that everything is built from smaller, clearer gestalts. Ecological theory is based on an entirely different view. Every material thing has its own behavior in the visual field, and these are learned. Objects are not decomposed and recomposed, but their consistency is registered from movement in the visual array. The consistency of things is not primarily geometric, though the built environment tends toward it. In Ecological terms, perceived consistency can be an attribute of texture, color, form or meaningful use of a thing.

Grids, Romboids and Free-form Objects and Organizations

The Beaux-Arts' use of nested and overlapping rectilinear grids and nested circular forms created extremely regular and repetitive rhythms. These patterns are visually strong gestalts in plan and elevation. They utilize all the Gestalt attributes of grouping (proximity, similarity, scale, etc.) very distinctly and could exemplify Gestalt theory as it might be applied in Architecture.

The transformation of form exercises of the Bauhaus and the more complex compositions of the Modern Movement test the strength of Gestalt forces in composition through experimentation. Both architectural theories stress the importance of unity in composition; the Modern Movement has simply attempted to find the limits to which composition can be expanded while still retaining a sense of unity. The test for whether unity is achieved in these more complex compositions seems to rest on Gestalt grouping techniques, and on concepts of balance, other than symmetrical, which are also gestalt-based. The Bauhaus test for success was less formalized than the Beaux-Arts methodology and relied to some extent on the creator's subjective judgement. Nonetheless, the underlying principles of composition in both theories are supported by Gestalt theory.

82
It is interesting to note that in some Modern Movement theory, notably that of Gropius, composition is de-emphasized in favor of a functionalist attitude toward planning and use of materials. To the extent this philosophy is applied in design it can find support in the Ecological theory of perception which places great emphasis on the fundamental understanding of things through use. In general, Ecological theory would not emphasize one geometry over another, but would suggest geometry affects use. Expressing a clear use then, would be of greater importance than the selection and application of simple or complex compositional geometries.

Hierarchy

Hierarchy in architectural composition is the order in which the importance of various architectural forms are ranked and related in their context. These rankings and relationships are based on several conceptual issues that can be analyzed in relation to theories in the psychology of perception. The first, and most commonly considered, deals with consistencies and dominance within a composition developed by relationships in properties of materials and proportioning, geometry and rhythm in composition. This leads to a second issue dealing with the general concept of unity. Object recognition is the third issue which is followed by place and closure recognition. Finally, the issue of whether man has a scalar relation to form that affects his sense of hierarchy in composition can be addressed.

Consistency and Dominance

Implied in the architectural concept of hierarchy is the idea of a consistency that must be part of a composition so that things of various levels of importance can be juxtaposed to it. This consistency provides some of the sense of unity which a composition might exhibit. An element of a composition has many characteristics such as texture, color, location, form and proportion, that may be utilized to provide either the consistency or hierarchy in a composition. Consistency is developed by similarities between characteristics of elements while hierarchy is developed by contrast between other characteristics of the elements. It is not uncommon for all elements in a composition to exhibit both relationships. For example, a stone building may utilize the same stone and proportioning everywhere to provide consistency, but change its texture, scale, or location to develop hierarchies. Consistency then is as important as contrast in the analysis of hierarchy in composition.

The following is an analysis of hierarchial compositional techniques of the Beaux-Arts and the Modern Movement from the Gestalt and Ecological psychological perspectives. The Ecological perspective pushes this analysis beyond the strictly
formal issues in hierarchical composition to issues dealing with the use of things. This deviation is unavoidable because Ecological theory refuses to separate issues of form and use.

The Beaux-Arts relied heavily on dominances of centers of symmetry and scale relationships, large scale being more important than smaller. Consistency was developed by similarities of any of the gestalt attributes of visual organization, but also relied heavily on rules of proportioning. Rhythms in Beaux-Arts composition exhibited nested symmetries and not overly complex sets of modulation. All these techniques can be supported by Gestalt Theory.

The Modern Movement favored similar techniques but was less exacting in their application. Symmetries are downplayed in favor of scale relationships and consistencies are developed through alignment and similarities in simpler form, color and textures. Modularity and proportioning is evident to some extent in modern buildings, but is not as pervasive as it is in Beaux-Arts work. Rhythms in modern buildings are developed as in the Beaux-Arts but are also developed from a new and more fluid methodology. An example is the mullion modulation of the Carpenter Center for Visual Arts at Harvard University by LeCorbusier. (fig. 1) In this building, alignment holds the elements together while the spacing has a wave motion with no clear points of focus. Therefore, the Modern Movement techniques, while exhibiting a slightly different emphasis than the Beaux-arts, can quite easily be evaluated in Gestalt terms. The Gestalt concept of varying strengths in gestalt relationships is also clearly evident in the design theories; the buildings considered the best architecture exhibits the clearest, though possibly not the simplest, Gestalt ordering.

The Ecological interpretation of these methodologies is similar to the Gestalt but in a total interpretation of form the Gestalt aspects would be downplayed in favor of decisions in choice of material and the use-related aspects of form. The Beaux-Arts generally felt that the only true and noble building material was stone. The Modern Movement utilized all materials and in general, tried to express the true nature of the material, its potentials and limitations. The Beaux-Arts gave less emphasis to use-related form and greater emphasis to symbolic and hierarchical form. Modern Movement reversed this and the maxim of "form follows function" appeared.

Ecological theory would support the Modern Movement interpretation of both material selection and use-related form. Ecological theory claims that basic to understanding the world is understanding of the affordances of materials and that this understanding does not separate the form from the material or use. Together, they form a whole interpretation of an environment. From this perspective, form cannot be discussed
without reference to use and material which is similar to the beliefs of the Modern Movement. Thus, while formal relationships can be distinguished and discussed as a separate aspect of an object, the usual interpretation is a totality which includes intrinsically what the viewer knows about the material and function of the object.

Unity

Some level of consistency in a composition implies the concept of unity, but since it is such a significant issue in architecture it requires further exploration.

Unity is an underlying concept of all design theory. It also has two distinct aspects. The first is simply the development of consistency within a composition which was referred to earlier and relies on the same principles as the methodology for developing hierarchy.

The second concerns itself with conceptual intention and its execution in building. Most architectural theory, whether Beaux-Arts or Modern Movement, has espoused the idea that a building required a single concept that all aspects of a building must serve. The test of a good building then, is that nothing can be added or removed without ruining the composition. The Beaux-Arts further limited composition to a single primary focus to which all other elements were hierarchically ordered. Duality was abhorred. The Modern Movement allowed greater flexibility, but in general, still required this singular conceptual unity.

Psychological theory does not directly address this formal issue, but there is no indication of support for it. Ecological theory in particular suggests that the discrimination of the relationships of things is relative to the viewers' intentions and needs and is not clearcut and unambiguous. The edges between places and events are fluid, and can expand and contract at the will of the viewer. One can be in a meeting and switch from a discussion with an individual to an appreciation of the entire group. One is not able to concentrate evenly on both at the same time; concentration on one or the other controls the sense of scale of the relationship. This is true of relationships in the inanimate environment as well. Thus the use of a singular idea that must dominate an architectural composition, this pervasive unity, has little relation to ecological concepts of environmental understanding.

Gestalt theory does not suggest there is a particular value in a singular unity in architectural composition any more than Ecological theory does. However, architectural unity corresponds to the strength of a gestalt; a strong gestalt does not permit ambiguity in its perception as an object.
Object Recognition

The concept of a visual unity based on a conceptual unity requires the ability to recognize objects. Both of the psychological theories find object recognition fundamental to perception, but they describe the process differently. Gestalt theory hypothesizes the figure/ground relationship; the force in visual organization forms the figural experience. The Ecological approach states that as the textural array of reflected light crosses the retina the discontinuities in the flow of the array can be noticed and that these discontinuities specify attributes of objects, not the least of which is the outline or volume or object itself. Ecological theory contends people learn to recognize most objects early in life and maturation is a process of redefining our knowledge of things based on greater experience and learning.

The Renaissance technique that Wittkower notes of putting buildings, particulary churches, on plynths or bases would seem to be effective from both a Gestalt and Ecological perspective. The technique clearly separates the object from its context. Having the buildings literally separated, standing alone, instead of, for example, being one of a wall of buildings, is equally successful, because its objectness can be perceived through movement over time.

Man is the Measure

All formal proportioning systems, in contrast to proportioning based on technical integration of elements, has contended that measure begins with human scale and proportion. Vitruvius' image of a man in a circle and square links human proportion to pure geometry and LeCorbusier's Modular attempts to provide a similar link between mathematical progressions and human form. Since humans come in varying sizes and shapes, these were of course attempts to define ideal relationships. The apparent conclusion would be that these ideas would have no basis in psychology, but this is not the case. Although from very different directions, both Gestalt theory and Ecological theory support the idea that people measure the environment in relation to their scale and location within the environment. The Gestalt concept of an ego as a central element in composition which exerts a force on the way environments are perceived would make the individual central to compositions. The force of the ego fixes the location of the individual and measures the environment in relation to that individual. The Ecological view is that everything is measured and scaled from the location of the eyes. Use-related scales, such as the height of a seat, are of particular interest to humans because they identify an affordance of the environment, in this case a place to sit. Thus, while these theories do not necessarily speak directly to the architectural methodologies for
proportioning related to human form, they do indicate a measured relationship of man to form that could be applied in design.

Place Recognition and Closure

The psychological theories consider place recognition to be as fundamental to perception as object recognition. It is also a major issue in architectural and urban design composition. From the Gestalt view, a sense of recognizable place can be achieved by highly integrated compositions of pure forms, and gestalt interrelations of parts, such as alignment, symmetrical ordering, and proportioning the parts to the whole. Separations from place to place require contrasts between the collective gestalts of one place and another. The higher the contrast the clearer the separation. These are attributes of Beaux-Arts composition to a greater extent than the Modern Movement. Design theories dealing with concepts of contextualism suggest that places need to be integrated with their contexts, as, for example, a facade needs to be composed. This would require an approach of providing some similarities with the context and some contrast. The exact balance between the two is the historic problem of contextual design.

Ecological theory would support the recognition of similarities and symmetries, but consider them less significant in perception. Perception in ecological terms is a process of discrimination, and this discrimination is based on a desire to know something or to find one's way. While complex environments such as Greek fishing villages seem difficult to understand because of their lack of formal order, Gibson would contend that most people living in them do not find them difficult to navigate in; it simply takes time and repetition to learn to discriminate one place from another. There is a slight suggestion in Gibson's description of places that greater contrast from place to place makes them more distinct, but limited compositional sets, such as the Beaux Arts, would not necessarily meet this objective. The Ecological theory suggests that there is a fundamental difference between places and objects; that is, they are geographically separate from each other and can not be moved. Therefore, place is recognized, in part, as an aspect of a progression and not simply from form contrast. Obviously, this interpretation of place recognition places a major emphasis on a concept outside the control of design theory. And finally, both psychological theories would find the excessive repetition of some housing developments a factor in both confusion in wayfinding and sense of individual place, and in contributing to boredom.

In design theory, one important aspect of place recognition is the sense of closure. Although one Gestalt characteristic is closure of form, perceived closure is more significant to place definition in the Ecological approach than in the Gestalt.
Ecological theory suggests that there are basic perceptions of form organizations such as convexity that are primary to our overall organization of space. The sense of enclosure is powerful in this theory and has the potential of taking on meaning from use and relation to human scale. The concept does not suggest clear geometries as being more significant than other forms of closure, but that contrast in closure can signify sequence and change of sense and use of place.

This matches well with both Beaux-Arts and some Modern Movement design methodologies. In the Beaux-Arts, the 'marche' or entry progression in a scheme usually was through a forecourt that provided a strong sense of closure and place. Courtyards were also utilized to separate elements and allow light to rooms. So, in siting and general arrangement, strongly configured surrounded space was the norm. Interior space also had a strong sense of closure in that designs were formed with distinct rooms where openings were made by puncturing the surface while the key to a sense of closure, the edges, were maintained.

Most Modern Movement buildings exhibit less closure than Beaux-Arts buildings. Siting and progression is usually not through articulated forecourts nor are edges of rooms always maintained. However, there are still many significant examples of well closed rooms and even exterior spaces which suggest that this type of spatial definition was not entirely forsaken.

Mood or Tone

Mood or Tone of a composition is difficult to define because it is intended to cover feelings that are not amenable to verbalization and are not verbalized in the process of experiencing them. It covers feelings of well-being that are perceived sensorially, such as the smell of a breeze on a Spring day as one overlooks a familiar valley. Moods and tones are interesting psychological issues.

The Gestaltist view suggests moods are learned gestalts based on a combination of the ego, characteristics of place, the social setting and learning. A Gestalt, or organized whole, can be a concept of the season, fall, which is an aggregate of related characteristics of an event such as a temperature change accompanied with leaf color change and shortened days. There is a collective tone developed from these experiences which can be associated with a mood of a festive season or of the passing of summer. The Beaux-Arts concept of tableaux was an attempt to capture the mood of seasons through the application of tonal characteristics of materials that imitate nature at a particular season. This can be described as applying the Gestalt concept of grouping by similarity; similar color and texture selections relate a season to a room. Organic architecture of the Modern
Movement is conceptually similar. Aalto and Wright's work that develops major relationships between natural and designed environments through similar geometries and tones work, from the Gestalt perspective, by evoking a mood through similarity.

The Ecological interpretation of these examples would be similar to the Gestalt interpretation. From this perspective, these color/texture issues would, in an overall sense, be a more significant part of perception than the formal ordering of geometries. Because the Ecological view holds that these basic, inseparable characteristics of things must be learned by everyone before they can function effectively in the environment, they become base conditions on which further understanding is built. They are a prerequisite to perception, and an integral part of everyday behavior.

Thus, the idea of tableaux and Organic Architecture as defined by Wright does have psychological justification from both Gestalt and Ecological perspectives.

Education in the Development of Mood and Tone

In the educational context, there were two methods of studying the ability of material and form to evoke a mood or tone. First, the Beaux-Arts lectured on the concept of tableaux, and their application must have been discussed in the ateliers of the various masters. The lectures were probably fairly specific in the methodologies of forming tableaux; later in the evolution of the Beaux-Arts, Garnier would attack this position by reclaiming the individual's right to select and invent decoration in design. Garnier's claim is one step towards an increased freedom in personal expression.

The Bauhaus took this freedom to an elemental level. They abstracted tonal experiences by exercises that developed the student's understanding of the nature of materials and color. The underlying assumption of these exercises was that personal experience is a prerequisite to formal education. The exercises dealt with gradations and classifications of colors and textures and with the nature of materials and their connections. The overriding objective was to sensitize a student to potentials of materials and give them a sense of sureness in their decisions.

Ecological theory would stress the value of this method of education. Again, the value would lie in the understanding of the basic qualities of things, their color and texture, the way materials can be formed to make objects. Since much of the Bauhaus education was sensitizing instead of intellectualizing, the Ecological theory has a particular perspective on reality that would support this approach. The Ecological view is that there is a great deal of perception and attention that can never be verbalized, but is none the less a primary aspect of
experience. A description of an event or object is always an abstraction and simplification of a perceived reality. Great poets have difficulty capturing the essence of a tree, but trees are easily seen and experienced. They are part of a pervasive reality that can be experienced in great detail emotionally but not necessarily intellectually. Since most daily experience is at this level, so therefore is understanding of the environment. The introductory course at the Bauhaus, and most basic design courses, are attempts at expanding the individual's ability to see and feel things about materials and their organization in a non-verbal way. Although some of these exercises, usually two dimensional, abstract compositions, also deal with Gestalt concepts of visual mass and balance, the sensing of order is stressed over the conceptual explanation of the feelings the compositions evoke. Wright's Taliessen building projects were, in an educational sense, his method of sensitizing students to the reality of materials. However, this technique has never really caught on in formal educational settings. All these teaching methods have a particular affinity to the Ecological conceptualizations of perception, based on direct experience and not intellectualization or symbol formation.

The Mood and Tone of Place

The sense of place is often partly a mood or tone based on a link between a particular physical setting and social grouping. Examples of social orders are families, communities, countries, churches, etc. They become linked to a place through repetitive use by individuals. Over time the links become exceedingly strong; the sense of a heritage related to a country is only one obvious example. These relationships, from the Gestalt perspective, are gestalts of a higher order which links a physical gestalt to a social one and to a sense of being. The parallel between Ecological Theory and Gestalt Theory is strongest here. Similar nested orders of events and feelings are hypothesized in Ecological theory but their boundaries are vague and shifting. Even from the Gestalt view, the overall gestalt of place can have varying degrees of strength for different persons. Since many of these associations and aggregations are as idiosyncratic as personalities are in general, they are difficult to collect into a statement of design intent. They nonetheless require recognition because of their great ability to elicit feelings of well-being and belonging. The Beaux-Arts' attempt at defining a typology for every building type could be on the one hand an effort to capture the essence of place, and on the other to standardize it.

The Modern Movement, with the exception of Organic Architecture, did not formulate a methodology for place formation that linked people's past experience with new designs. Organic Architecture, by utilizing similar tones and
forms as the surrounding natural setting suggested, began to develop a general methodology for the mood and tone of a place. The general idea of contextual design has a similar intent where social and physical structures that represent a particular physical and historical place are preserved and strengthened.

In summary, the issues of mood and tone of place are difficult to formulate into exact design methodologies because they require some innate sensitivity to a context, and the design process needed to achieve a sense of place need not be simply mimicking the past. Psychological theory would support the prominent role a sense of place has in human experience, and it is gratifying to note that the design theories studied here do attempt to address the definition of a place.

Explicit Symbols

Explicit Symbols are forms that an architect employs in design that are intended to symbolize a clear, verbalizable concept. The word explicit is utilized here because from some specific psychological viewpoints everything has symbolic content, including moods and tones, whereas others prefer to limit the meaning of symbols to a more infrequent mental activity. This is a prime difference between the Gestalt and Ecological views, and this difference might suggest divergent directions in design.

The Gestalt theory of isomorphism between a geographic environment (reality) and a behavioral environment (what we perceive and imbue with meaning) suggests that everything experienced is a symbol or set of nested symbols representing a larger concept. A gestalt is a symbol in the behavioral environment that represents a combination of the geographic environment and social and personal interpretations of it. An extremely strong gestalt is an explicit symbol. Most of the explicit symbols on which people operate would be reasonably similar within a specific culture because they are developed and reinforced by formal education. The Beaux-Arts education into the meaning and appropriate application of the orders and other specific configurations for building types and elements is such an education. If appropriately applied, the form symbolizes a specific social relationship believed to be culturally accepted. However, there is a circular logic to this educational concept. If the Ecole des Beaux-Arts theory lectures are the only place within the culture that these form meanings are explicitly identified, then how can it be assumed to affect a population who has not benefitted from the education? There are two answers to this question. The first is that architectural education and formal relations are developed solely for the educated classes of people. The second is that if all buildings are built with the appropriate formal orders, then there would develop a consistency in buildings that
could be sensed, though not explicitly learned. Probably some of both answers were used to justify this approach.

The Ecological view is that symbols play a much less important role in perception. Its core concept is direct perception, and assumes an inseparable relationship between the physical qualities of things and their use. In this theory, perception is of use and form; use is not a symbol or gestalt applied to form. This theory would not support the intricate applications of specific forms prescribed in Beaux-Arts education. Instead, it would concentrate on places and scales appropriate for human use. Acquired meanings are simply developed from attending to using things and from formal education, and Gibson contends that this activity permanently changes the perception of the environment. These changes are not abstract characteristics of an object, but are the object. The function and the object are inseparable. Gibson does not disregard the use of symbols in science and writing, but contends that they are not that significant in our daily behavior. From this perspective, one needs to be taught symbols and how to look for them as well as how to think about them. Symbolic interpretation of architecture, such as recognizing a style as representative of a theory of design is not precluded, but is recognized as an abstract thought process not normally associated with behavior in an environment. This attitude of the diminished role of symbolism would support the Modern Movement concept that form should support function. However, as Aalto points out, function requires a broad definition which includes emotional values as well as the more usual use-related functionality.

It is tempting to think that these divergent views represent the difference between architecture as art and architecture as a purely functional object. Architecture as organized figurative symbols is simply one interpretation of the art of architecture. The other attitude is that visual perception is a set of experiences that cannot be replicated verbally and conceptually, and that a portion of the art in architecture takes place in this realm. It seems that the masters of architecture and architectural education, whether Beaux-Arts or Modern, have combined the two possibilities in their work, and this is what has made them great.

Evaluation of the Psychological Theories

Since the analysis in this work has been of architectural composition from two psychological viewpoints, it seems appropriate to comment generally on the strengths and weaknesses of these two perspectives.

The strength of Gestalt theory is that it classified certain recognizable relationships such as figure/ground, and
grouping by similarity, proximity, etc. However, the assumption that these relationships are formed by forces in the behavioral environment that are similar to physical forces, but can represent formal relationships as well as emotions, has not been proved. It is known that mental activity is chemical and electrical, but its exact methodology is yet to be discovered by neurological research. Gibson is also highly critical of some of the research methodology utilized to verify Gestalt concepts because he contends that they do not represent human behavior in a three-dimensional world. It is also difficult to imagine that, as the Gestalt perspective suggests, all experience is symbolic. It is much simpler to assume that only particular forms and situations are symbolic in the sense that they stand for a meaningful concept. This is of course, the Ecological perspective.

The Ecological theory's strength is its inherent three-dimensionality and its reliance on a flowing visual array. It seems conceivable. Its weakness is that it has just begun to develop substantiating scientific evidence for its concepts. The theory still has several underdeveloped areas that need articulation and verification. In terms of this inquiry, the area requiring the most development is the nature of artistic perception, which was mentioned as a particular problem but never received elaboration. Gestalt theorists would criticize Gibson for not describing exactly how the perceptual system works. He simply avoids the Gestaltists' need for hypothesizing a behavioral environment that is at least physically isomorphic to the geographic one by saying that the issue is irrelevant. He maintains the concept of direct perception, which remains inexact. However, since exact brain activity is at a neurological level as yet undecipherable, his lack of a clear hypothesis in this area may be reasonable. Both theories seem plausible and neurological research may find one more reasonable than the other. However, there is also the possibility that, to some extent, they are both correct, for the brain's ability to multi-process information should not be underestimated.

Educational Implications

The implications of these psychological theories for architectural education are somewhat divergent. Gestalt theory emphasizes the development of stronger and stronger gestalts built on the interrelationships of individual gestalt characteristics and symbols. The Ecological approach would strengthen the importance of texture and contrast in composition. Symbolism would be less important, and use-related place formation more important. Gestalt composition is a formal compositional technique, whereas the Ecological approach would give equal validity to abstract and intuitive composition. Both the Beaux-Arts and Modern Movement compositional theories have
aspects that would be supported by one or the other psychological theory, as the previous discussion describes.

Architectural education has a difficult role in that the best possible thinking on the subject of composition is inconclusive. There are experiences that are inherently visual and can only be judged visually, and there are other ideas amenable to language and teaching. One can not be allowed to dominate the other in a broad design education.

Concepts, which seem to be inherently language formations, are proving to be as relative to context and individual interpretation as purely visual presentations. Juan Pablo Bonta in his book Architecture and its Interpretation analyzes this relationship as it is expressed in architectural history. He concludes that:

The goal of architectural interpretation is not permanent knowledge. Architectural interpretations are subject to the general trends of the history of ideas. Interpretations are cumulative to a certain extent: each critic can build upon what has been said before. But, just as in the process of accumulation of scientific knowledge (Kine, 1962), the cumulative processes in architectural interpretation are interrupted from time to time by 'revolutions' in which everything is re-examined, and old paradigms no longer relevant to present problems are abandoned. We interpret buildings in certain ways because, in doing so, we can throw light upon aspects of the world in which we live. Interpretations are discarded--like forms--not so much because we get bored with them, but because they cease to fulfil the initial, cultural role, and new interpretations more closely in line with contemporary interests are bound to arise in substitution of the old ones.  

He further contends that an idea has an initial phase of growth, a maturing, and then a slow decay. Bonta says "Ideas often become impoverished and degraded as they become entrenched in self-perpetuating verbal traditions." Ideas become irrelevant to current situations or so obscured by interpretation that their original clarity and relationship to a social context are totally lost. It is particularly important to stress the relativity of ideas in architectural education because the proof of whether people respond to composition in ways suggested by theory is still far from proven. Therefore, architectural education should develop a student's respect for the theories of the Beaux-Arts and Modern Movement composition as well as other forms of composition, but they should be presented in context. Their methodologies have produced inspiring architecture; yet for them to remain vital they must
be seen in their original and re-examined in light of current understanding in the psychology of perception.

Summary

The Ecological theory of Gibson demands an understanding of form from the flow of light impinging on the optic array. Architectural form is something to be in, move around and through. Experience is registered over time and is highly directed by individual motivation. The appreciation of the aesthetic of a place can be done at many levels of nested relationships, from detail to panorama, and from a variety of viewing points. This makes architecture an essentially different art form than painting and even sculpture. It suggests that design might have levels of interest from detail to room configuration to overall organization. More normal behavior in the environment, Gibson contends, is at the use-related level. Doors suggest passage, chairs sitting. An environment can be formed that is useful and provides a variety of options for use supporting flexible behavior. From the Ecological view, use is scale related to a species, and therefore something like a sill height of a window needs to be in some relation to human viewing heights to be useful. At the most primitive level of experience, the basic natures of materials are the essential experience. This need to understand material could conceivably place a renewed emphasis on the qualities of materials selected for building finishes and details.

From the Ecological perspective, the role of symbolism is the most difficult and illusive issue to understand. Amos Rapoport, in discussing some of Gibson's ideas, has suggested that in present western culture it may be possible to identify a consensus on the meaning of use-related objects, but that higher levels of meaning have become far more personal than in other historic periods and thus are unpredictable. He reinforces Juan Bonta's idea that symbolism is relative and that

Today it is far more difficult, if not impossible, to design in the associational world since symbols are neither fixed nor shared. . . . The solution may then lie in openendedness—-not just of function, but of meaning, so that people can take possession by personalizing, since, as we have seen, man takes possession of the world through symbolic means.3

Gibson seems to limit symbolism to formal languages that are learned. Use and feeling related to objects are evolving personal definitions of the object and not symbolic layers applied to the object. To Gibson, environments can be extremely meaningful without being symbolic. In fact, symbolism takes mental effort; for example the identification and classification
of a building as "gothic" requires the understanding of what it means, beyond a formal vocabulary, to be gothic. Gibson contends that the large majority of people do not perceive in this way, but that environments are nonetheless very meaningful. The meaning is related to personal experience of place and social situation. In form terms, it simply requires a recognizable place and form that is somehow able to grow meaningful to the individual. This may require, as Rapoport suggests, multiple options and variety so that through varying interactions with the environment the individual develops a rich and varied interest in it.

Design theories have historically searched for a singular ideal world; the idea of the perfect sacred space, the hierarchically ordered urban form supporting a fixed social structure. Building in the modern world does not, in general, start with a search for the ideal, the sacred or the ritualized. Nor can it. In the first place, most building is a commercial venture that does not, on the face, have a utopian base, and second, there are real function and site constraints that make problems complex and multi-faceted. This type of environment is more easily understood in Gibson's Ecological terms. It is an environment of relative values and meanings to various individuals, but it can be given distinct visual form capable of growing in meaning. This requires contrast from place to place and a level of detail and complexity capable of sustaining interest. Form may follow formal ordering systems, but may also be produced intuitively. Neither, from the Ecological perspective, is intrinsically more capable of evolving in meaning.

Gestalt theory essentially supports the most formal compositional and symbolic systems. Prak, Arnheim, Lang, and Jules have shown how the theory can be applied to the interpretation of architectural form. Gestalt theory can be utilized in developing a measurable value scale for hierarchical interpretation of form. All gestalts, in theory, are symbols; they stand for something in the real world, but they are themselves in an individual's behavioral world. By implication then, symbols can have hierarchical values. In general, this supports a purely Beaux-Arts method of design and in ordering technique, this would probably be the case. But, in light of the previous discussion of designing in the modern world, the method would not be limited to singular centering hierarchies of the Beaux-Arts. Gestalt relationships can be employed to order complex, multi-focused problems. In Gestalt terms, better design has stronger gestalt interrelationships of component parts because they are most easily recognized. This, too, is measurable in a comparative sense, and, as in the Ecological view, can be layered at a variety of scales.
In conclusion, the psychological perspectives can provide theoretical underpinnings to aspects of compositional theory which have lost credibility from worn out rhetoric and archaic rationales. The two compositional methodologies of the Modern Movement and Beaux-Arts are not simple, single concept theories, but rather have great richness and variety addressing many aspects of architecture. They span both psychological theories forming a fascinating and complex mosaic.
Footnotes & Illustrations


2 Ibid., p. 180.


Illustrations

1 Mullion modulation
Carpenter Center for the Visual Arts, Harvard University
Le Corbusier