

ARCH 121 – INTRODUCTION TO ARCHITECTURE I

WEEK 3: Form: Perceptual Laws of Visual Organization (Gestalt Theory) and Compositional Principles (Part 1)

From: Roth, L., Understanding Architecture: Its Elements, History and Meaning

1. Aesthetic delight: Seeing Architecture

After talking about the primary elements of design, this lecture will explain how visual information is perceived and how these elements come together to form visual compositions. Visual compositions, their perception and principles of formation are evaluated under the general topic of aesthetic delight.

As it has been explained in the first lecture, the third component of Vitruvius's triad was *venustas*, in other words beauty or aesthetic delight. This component is the most complex and diverse of all the components of architecture, since it involves how architecture engages our senses and how it shapes our perception and pleasure of (or discomfort with) our built environment. It is an area which many people have difficulty of coming to terms, since it involves subjective responses that change from individual to individual. Yet it is still possible to talk about some basic principles that explain visual perception and composition.

2. Visual perception and Gestalt Psychology

The visual delight we get from architecture starts with how we perceive it. Therefore in order to understand how visual delight or beauty emerges or is created, we must first understand how we perceive and interpret visual stimuli.

It is a known fact today that human mind is programmed to search for meaning in all the sensory information that is sent to it. This characteristic evolved with the survival instinct of our ancestors, who had to watch out for any kind of visual information in the environment for protecting themselves and for finding food.

How the mind interprets forms and patterns that are presented to it, or how visual information is perceived, is explained by Gestalt psychology in 1930's. The word *gestalt* is a German originated word, which means "the shape of an entity's complete form" (shortly it means shape). It states that there are innate mental laws that which determined the way we perceive objects. Shortly, it maintains that:

- when a person is faced with unknown visual information, the mind organizes the data according to certain innate (built-in) preferences, and because of that,
- human beings see objects in entirety before perceiving their individual parts.

Therefore when we see a figure, we don't see or perceive its individual parts first, but we see the complete figure in its entirety. We see whole forms instead of just a collection of simple lines and curves. Therefore the motto of gestalt theory says that "the whole is greater than the sum of its parts". It means that the essence of a whole could not be explained by seeing just the parts of the whole. It is just like a musical piece or a song - a musical note (la or si, for example) is totally different than the song of which it is a component.

Gestalt theory further states that the wholes are structured and organized according to grouping principles, which are as follows:

Gestalt Principles of Visual Perception

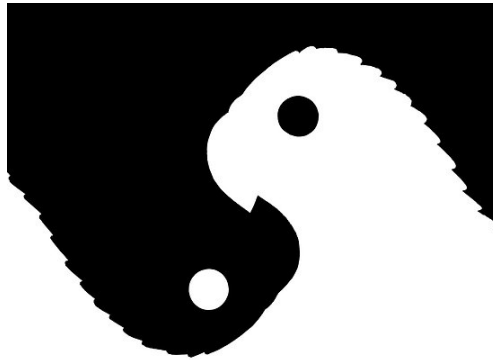
- a. Figure and Ground
- b. Proximity
- c. Similarity
- d. Closure
- e. Symmetry
- f. Continuity
- g. Simplicity

3. Gestalt Principles of Visual Perception

a. Figure and Ground

Figure and ground principle states that the eye distinguishes an object from its surrounding area. For this reason, a form or a shape is perceived as a *figure*, while the surrounding area is perceived as the *ground* (background). According to that, a shape seen in the context of an enclosing shape will be interpreted as a form against a background, with the mind choosing which is which.¹ The figure is seen to be at the front and the focus at any moment is the figure.

The contrast between the object and its surrounding area, such as dark and light or black and white, enhances our vision of figure ground. Figure ground organization is used by designers in two or three dimensional compositions. It reminds us that what we place into a composition is as important as what we do not place. The emptiness of what we do not place also acts as an input to our composition.



The famous example for explaining figure-ground principle is the figure below, depicting both a vase and two profiles of human face. Depending on whether the white or black color is observed as the figure, the mind interprets the picture either as a vase (black) or two human faces (white). It is difficult (or impossible according to Gestalt theory) to see the two figures at the same time. The mind has the tendency to choose which one to see at one time.

¹ Roth, L. Understanding Architecture: Its Elements, History and Meaning, p. 59.

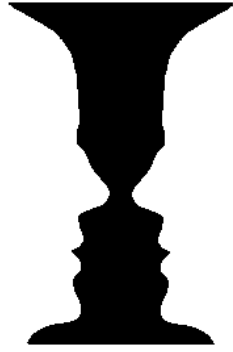


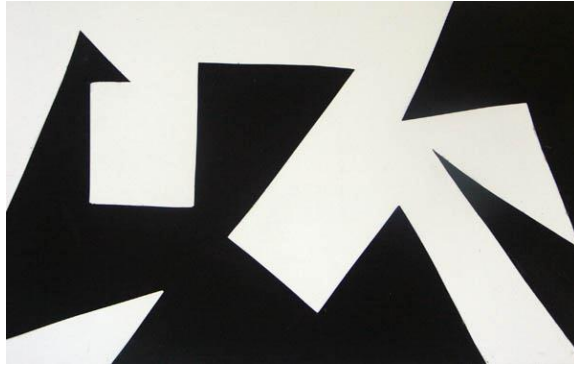
Figure and ground: A vase or two human figures



Figure and ground: Either the white chess pieces or the black human figures in between (left); Either white horses and knights in black background is seen or black horses and knights in white background (right)



Figure and ground: Either black birds in white background or white birds in black background



The contrast between the object and its surrounding area, such as dark and light or black and white, enhances our vision of figure ground.



It reminds us that what we place into a composition is as important as what we do not place.

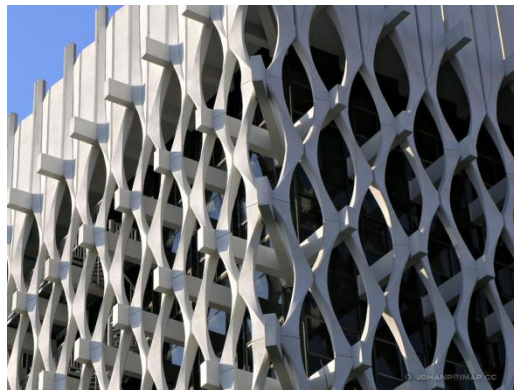


Figure and Ground: facade elements and the cavities between them creating figure ground affect

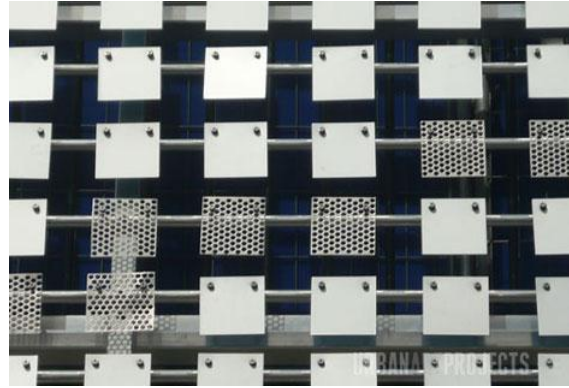


Figure and Ground: the contrast between the facade elements and the surface creating figure ground affect

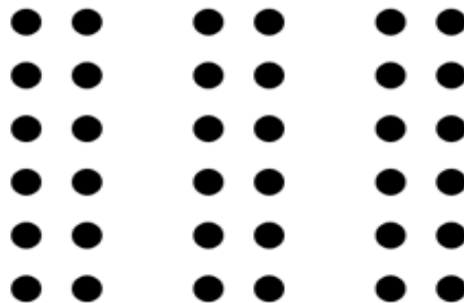


Figure and Ground: La Defense, Paris, France

Figure-ground is also created by volumes. The cavity of the building frames the view and forms a figure ground affect

b. Proximity

Proximity principle states that objects that are near or close to each other are perceived as a group. For example in the figure below, there are 36 dots altogether, but they are perceived as three separate columns of dots. This principle is used in design to emphasize the connectedness of figures or objects.

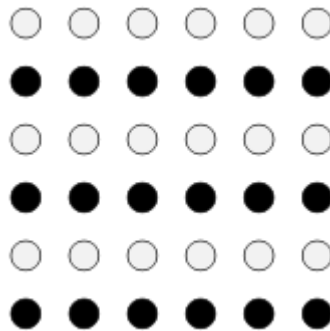




Proximity (Photo on the left: Roberto Alonso): Proximity of windows make them perceived in groups of two

c. Similarity

Similarity principle states that items that are similar to each other are perceived as a group. If there is an assortment of objects, we perceptually group the similar ones together. Similarity can occur in terms of shape, colour, texture or other qualities. For example in the figure below, there are 36 dots altogether, which are at equal distance from one another forming a square. 18 of them are dark shaded and 18 of them are white shaded. In this formation we perceive the white circles to be grouped together and dark circles to be grouped together, forming six horizontal lines.

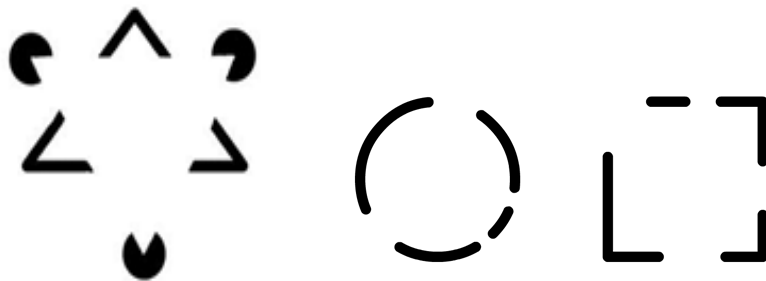


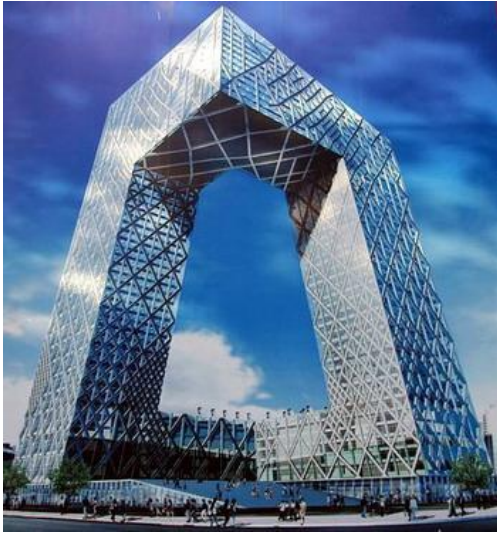


Similarity (Photo on the left: Roberto Alonso): Dark colored windows are read as a group and light colored window panes are read as another group, forming horizontal lines.

d. Closure

Closure principle states that people perceive objects such as shapes, letters, pictures etc., as being whole when they are not complete. This means that when the parts of a whole picture are missing, our perception fills in the visual gap. Research has demonstrated that the reason of completing a regular figure that is not actually complete is for the purpose of regulating the surrounding stimuli. For example in the first figure below, there are no triangles or circles, but our minds fill in the missing information to create shapes and images that are familiar to us. In the second figure, there are gaps missing from the shapes, but we perceive them to be a circle and a square. If closure principle did not exist, we would perceive them as a collection of different lines with different angles and lengths.





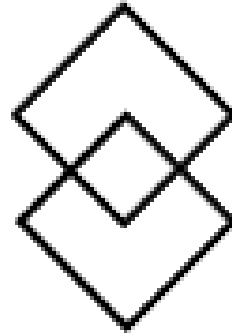
Closure: China Central Television HQ, Beijing; Closure also works in volumes. Although the prism is not complete we still sense the space as a prism



Closure: Closure also works in facade articulation. Although the square of the facade is not complete we still read it as a square

e. Symmetry

Symmetry principle states that the mind tries to see a center point in between the objects and tries to perceive objects as being symmetrical. Research has shown that the mind does such a thing because it is perceptually pleasing and *easy* to be able to divide objects into an even number of symmetrical parts. For this reason, when two symmetrical elements are separate, the mind perceptually connects them to form a familiar shape. Moreover, the similarities between symmetrical objects facilitate grouping them to form a combined symmetrical object. For example in the first figure below, there are 6 individual brackets, but we see them as 3 symmetrical pairs of brackets. In the second figure, we do not see small diamond and two irregular figures above and below it at first, but we see two overlapping diamonds.



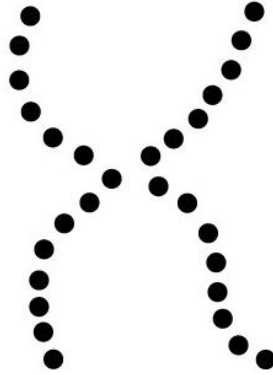
Symmetry: Reconstruction of the Parthenon (left), Taj Mahal (right)



Symmetry: Saint Peter's basilica, Vatican (left); A colonial type of house, Raleigh, USA (right)

f. Continuity

Continuity principle states that if the objects are aligned, they are perceived as a group and integrated into a perceptual whole. If there is an intersection between objects, people perceive the two objects as two single uninterrupted objects. This happens because people have a fondness for continuous figures. For example in the figure below, rather than seeing four separate line segments, we tend to see two intersecting lines creating the shape of an X.



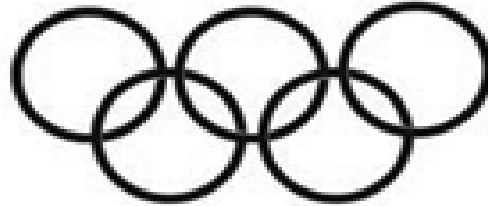
Continuity: The alignment of raised parts of the facade element makes the raised part perceived as a group (left); the alignment of facade elements makes the whole facade perceived as a group (right)



Continuity: The alignment of facade elements creates two groups, one of beams and one of windows

g. Simplicity

Simplicity principle states that reality is organized and reduced to the simplest form possible. People perceive the world by eliminating complexity and unfamiliarity in order to observe a reality in its most simplistic form. This happens because the mind tries to decrease the effort of processing visual information to a minimum in order to be able to create meaning. For example in the figure below, we see a series of circles rather than seeing many complicated shapes.

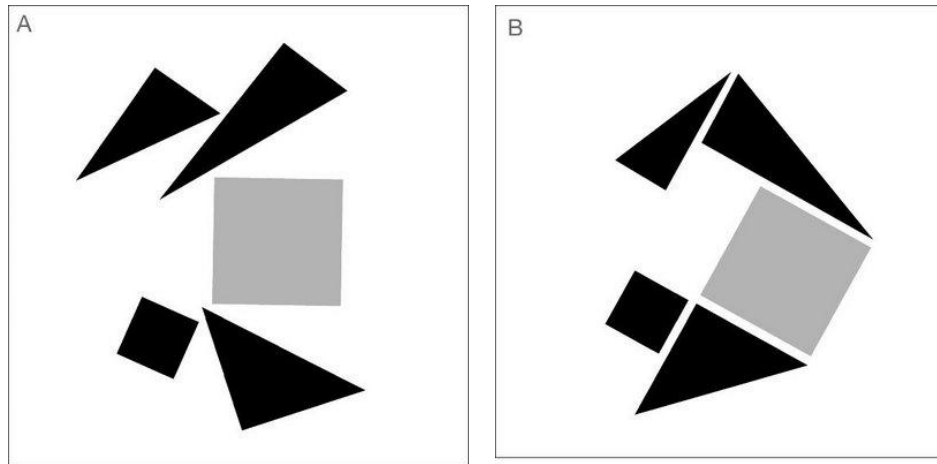


Simplicity: We read the form as a totality although there are different parts. We also see continuity, proximity, similarity. Boston State Building, Boston, USA (left), Guggenheim museum (right)

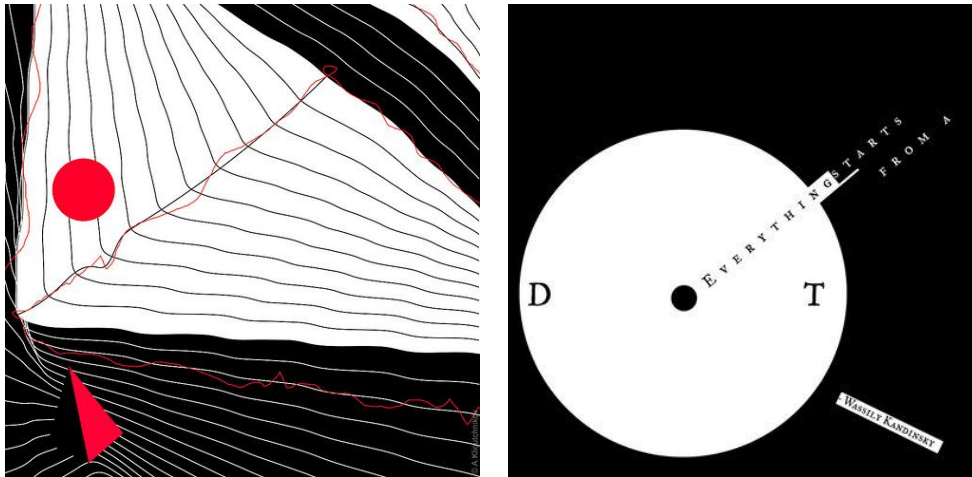


Simplicity: We read the form as a totality although there are different parts. We also see continuity, proximity, similarity. La Tourette Monastery (left)

These principles (figure and ground, proximity, similarity, closure, continuity and simplicity) could be used to achieve 'visual unity' in compositions. They may help to create an overall pattern (an order) in the composition, where the 'whole becomes predominant over the parts'. When you see the composition, you perceive the whole pattern first before you perceive the individual elements.

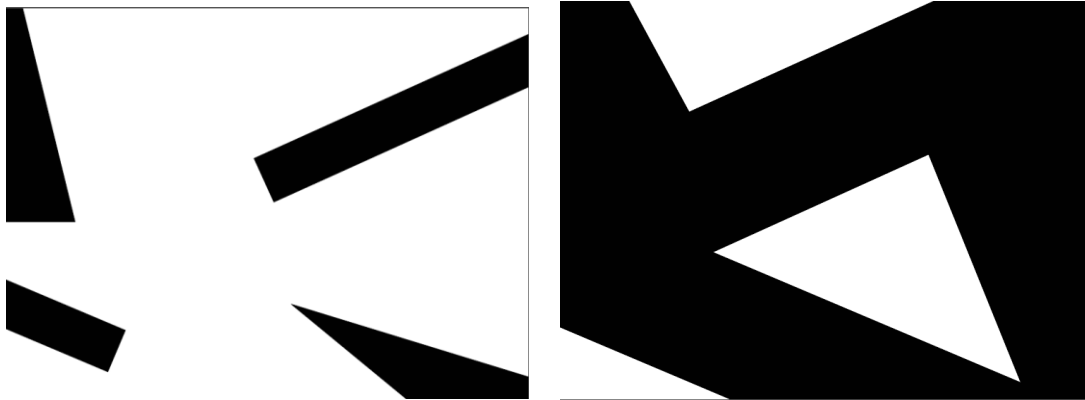


Gestalt in compositions: Unfinished composition (left), finished composition where the whole is dominant over the parts (right)



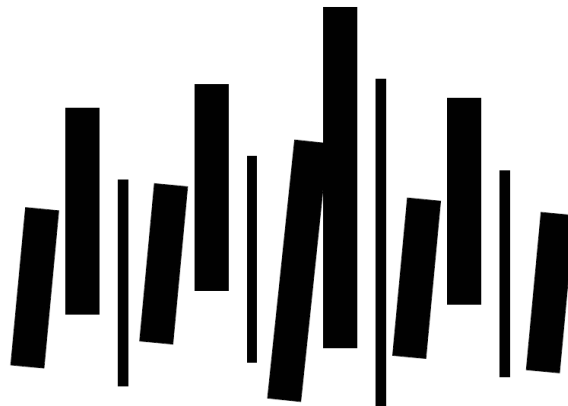
Gestalt in compositions: figure-ground, continuity, http://www.flickr.com/photos/thedot_ru/6114666108/sizes/m/in/photostream/, By thedot_ru (left); Student project, Dana Gould, 2007 (right)

As the figures grow in size the figure-ground relationship is read better:



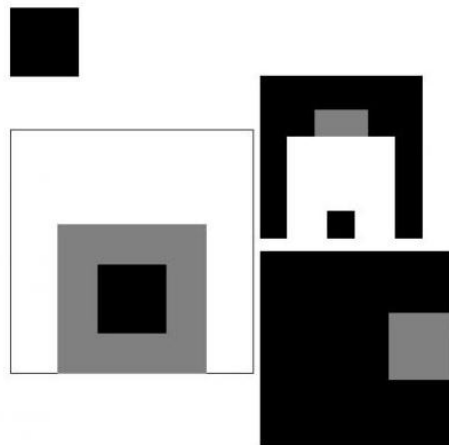
Weak figure ground (left), Stronger figure ground (right)

<http://www.idemployee.id.tue.nl/g.w.m.rauterberg/lecturenotes/DG000%20IMCB/background/Design%20Theory,%20Gestalt%20and%20Composition.pdf>

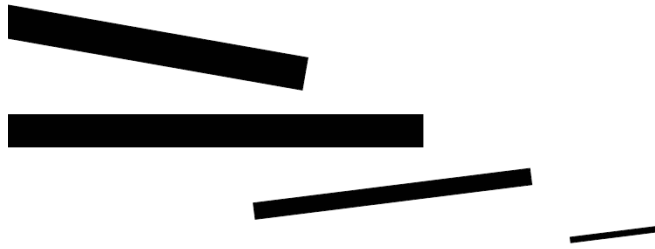


Gestalt in compositions: Proximity creating rhythm in composition

<http://www.idemployee.id.tue.nl/g.w.m.rauterberg/lecturenotes/DG000%20IMCB/background/Design%20Theory,%20Gestalt%20and%20Composition.pdf>



Gestalt in compositions: Similarity creating unity in composition
<http://archishots.wordpress.com/2009/12/15/gestalt-and-architecture/>



Gestalt in compositions: Continuity

(<http://www.idemployee.id.tue.nl/g.w.m.rauterberg/lecturenotes/DG000%20IMCB/background/Design%20Theory,%20Gestalt%20and%20Composition.pdf>)