

Gravity Effect And Linear Perception Of Urban Space

How the human's visual perception appears and develops is a basic issue which psychologists have explored for a long time. Though there are many arguments about that, we can realize that the human's visual perception is determined not only by his inherent cause but also by his acquired experience.

According to its origin it needs at least two parameters: predominant information and reference information. The former refers to the attribute of things themselves, and the later refers to all the other information. People invariably needs any reference information when he perceives the external world in order to acquire an accurate perception and a comprehensive impression. Some of those reference information probably come from external environment, such as the distance between objects, shelter, perspective, etc. At the same time the rest reference information can come from the internal part of human organism, such as the roll of eyes, the posture of body, etc. Nevertheless, no matter what kind of information, they must be processed by human brain before they convert to perceptions.

Visual perception and space perception are very similar to the other perceptions in many aspects. They are able to process and make selections about the external information. Actually not passive they behave as a type of intellection. For example, visual perception is by no means restricted by the projection of light and shadow on the retina. In general, the perceptive properties of an object are manifold. Thus visual perception obtains an ideal place for intellectual activities to permit them to perform freely. And then visual perception assembles shape, color, texture, motion and so on after that converts them into various explicit and extreme complicated constructions of space-time. Consequently in some cases the psychological imageries of external objects are very different from the projections on the retina. However, the information is processed by perception unconscious so people always can't realize that.

As we know, the experience of the effect of gravity force is a very important one among the reference information. Probably we can consider that majority of reference information of human space perception are in accordance with the experience of gravity force. The specialists have shown clearly that no matter what kind of perception, such as perceptions about size, distance, depth, vertical and level, will make mistakes when the normal relation between the body and the ground is destroyed (Jing Qicheng, Pen Ruixiang, 1963, 1964; Pen Ruixiang, Lin Zhongxian, 1965).

Above-motined theories are basic environment psychology theories of human visual perception and space perception. And in urban environment the psychological activities affected by the experience of gravity force are also what designers should pay much attention to. Designers employ the space's shape and the facade's lines to form the urban environment. All of these elements they used are in connection with human perception directly. Perhaps we can draw a conclusion that urban environment become meaningful only because of human perception and furthermore is judged by it.

Thus the experience of gravity force commences to act on the elements of environment without exception.

A typical example is urban building. It is the chief visible subject of the environment and the influence of building facade's lines on urban space is self-evident. Most building facades contain mainly two sorts of lines: horizontal lines and vertical lines.

Horizontal lines feel stable, easy and mild. On the other side vertical lines feel excited, impulsive, lofty and sudden. Horizontal lines have a tendency of guiding movement so they give us a smooth and high-speed impression; vertical lines guide the line of sight to turn upward and hinder it from horizontal movement. Further reason is in relation to some basic physiological and perceptive factors. In physiological aspect the field of eyesight is approximately an ellipse which has a long horizontal axis and a short vertical axis. The direct result it brings about is that a little change in vertical direction can lead to an obvious effect upon the scale of subject. Hence the design on vertical elements of buildings or environment facilities is more apparent than that on horizontal elements. The more fundamental reason is that, the basic perceptions relate to the above-motivated experience of gravity force. The overwhelming majority of motions in our daily lives are horizontal. If you want to move vertically you must draw support from particular implements, such as stairs and elevators. Human's motions in horizontal direction are easy and can act on his own. Whereas vertical motions need intervention of material force. Its essence is a representation of the effect of gravity force. Because of this psychological influence

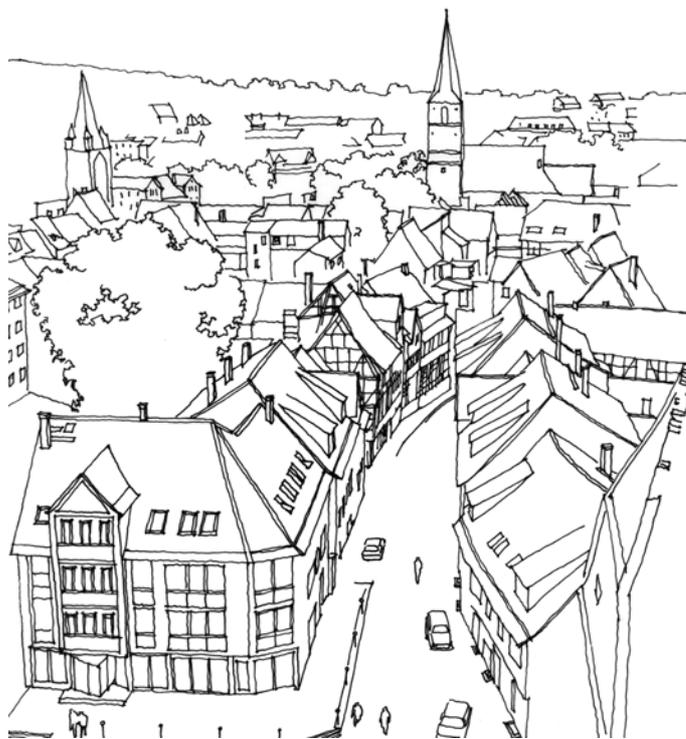


Figure 1 A small town in Europe

when people's sight follows a horizontal line he can appreciate a kind of inherent feeling, a kind of rationality and a kind of reason. In the meantime, he always encounters some barriers in this process therefore the property of finite is emphasized. On the other hand, vertical line symbolizes infinity, wild joy and passion. Its length seems unfathomable and unable to be held. It frequently ends in inanity. Thus its uncertainty increases. Comparatively speaking, I think vertical direction has more supra-humanistic force and more feelings of achievements. Contrary to it

horizontal direction represents the reality of life and feels more humanistic. Figure 1

shows a typical small town in Europe. People lived in horizontal arranged houses. The vertical towers have little relationship with their daily life.

The greatest achievement of contemporary applied science, in my own opinion, is bringing gravity to subjection. Actually it's also a kind of revision of universal gravitation. Compared with undeveloped ancient periods, this characteristic become more obvious. A classic case in point is best provided by celestial which can be universally found almost in every corner of the traditional culture. Most celestials are endowed with flying feature without exception. Indeed ancient people treat the free motion against gravity as an ideal. This is a valid evidence to prove that the importance of gravity in ancient periods can not be substituted. In western architectural history the Renaissant architecture reflect the return of humanity. A remarkable feature is that the horizontal lines are emphasized in architects' design. They reinforce realistic feeling and accommodate the people's adoration to gravity. But the former Gothic architecture, as everyone knows, lay much emphasis on vertical lines and uses vertical tall space. We regard it as a personification of godhood. We can experience supernatural force from its facade's lines and interior space and thereby feel more self-abased. This self-abasement is considered as a result of the depression humanity as some theorists say. No matter what kind of architecture, Gothic and Renaissant and others, architects employed the experience of gravity force for various purposes consciously or unconsciously. Even many modern architecture can be classic examples too. A good case in point is the works of American great master F. L. Wright, especially a series of villas. He also brought horizontal lines into full play. His works feel warm and fragrant.

Let's go back to reality. Lack of human interest in contemporary cities is popularly criticized. It is partially on account of the buildings' expansion to high altitudes due to the crowded urban space. The ratio of buildings' height to width is quite big. They emphasize impressions of vertical direction and represent powerful material force. We often use similar words like "rise" or "spring up" to describe a blossoming scene, also imply the delight of bringing gravity to subjection. Because



Figure 2 A funny picture of American city

people's vertical motions must have the aid of particular implements the increase of skyscrapers have undoubtedly strengthened the predominant effect of material force. For this reason, the elements of humanity have been weakened. On the contrary, the ratio of height to width of low buildings, especially the continuous connected units, is far less than 1. In consequence they are close to humanity. It

becomes a reason to promote the erection of low buildings in some cities and some

urban districts. Figure 2 is a funny comparison between the front low buildings in a horizontal row and the rear urban constructions. Obviously the former is more humanistic. Concerning the shortcomings of skyscrapers in this area we perhaps could correct it through podiums. In most urban street space the distance between people and buildings is so limited that frequently the field of eyesight is filled with the image of podiums but not the principal part of the skyscrapers because podiums are more closer to pedestrians. We can build podiums with horizontal linetype as buffers to partly remit the immediate attack on people's mentation from the back skyscrapers.

From above discussions we can find out the intrinsic influence of the experience of the effect of gravity force on the humanization of urban environment. It is absolutely not as simple as designing any facade's lines to revive the lost humanity. Nevertheless, the experience of the effect of gravity force is subject to variation following the developing technology, I think. For example, human activities in outer space will become universal in the future and the inherent experience of gravity force has to change consequentially. As we know, there is an interaction between human space perception and it. Thus people's space perception in urban environment will also be different from ours because of the new experiences.

Hence the influence of the experience of gravity force on visual and space perception that we talk about is relative. And this article seems unlikely to provide a manner in which you can solve this great problem. It simply discusses the theory essence in this field. Only for reference.

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