

The concept of Visual Perception; A comparative study of Buddhist and Western Psychology

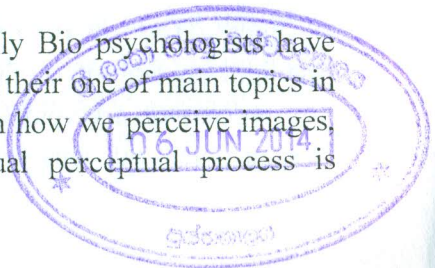
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Introduction

Sensation and Perception is one of the highly discussed topics in psychology especially in cognitive psychology. "Sensation is the stimulation of sense organs. Perception is the selection, organization and interpretation of sensory input".¹ Sensory organs absorb sensations as stimulation from the environment, the brain perceives them. These two processes are very close but different from each other. In some cases although process of sensation is ok, perceptual process might be problematic. However this article is going to focus only on visual perception of human beings. And also compare two major psychological streams that describe visual perception differently. Those two streams are nominated as western psychology and Buddhist psychology.

The Interpretation of visual perception in Western Psychology

Western psychologists especially Bio psychologists have been studying visual perception as their one of main topics in psychology. They mainly focus on how we perceive images, colours, shapes and sizes. Visual perceptual process is

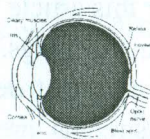


described in a biological perspective by them, including the structure, disposition, pathway and characteristics of the eye.

Humans usually have two eyes and it is the major sensory organ of them."The eyes serve two main purposes: they channel light to the neural tissue that receives it, called the retina and they house that tissue. Each eye is a living optical instrument that creates an image of the visual world on the light-sensitive retina that lines its inside back surface."²

The major stimulus of the eye is light. "The stimulus for vision is visible light, a small band of energy contained within the electromagnetic spectrum."³ "Light waves vary in amplitude (height) and in wave length (The distance between peaks). Amplitude affects mainly the perception of brightness, while wavelength affects mainly the perception of colour."⁴

The structure of the eye is very important to understand the visual process that identified by western psychology. The eye is like a camera. There is a very complex process within the eye pertaining to visual perception.



Cornea - "The cornea, a rigid transparent structure on the outer surface of the Eyeball, always focuses light in the same way."⁵ The light enters to the eye through the cornea.

Lens - "The lens is a transparent eye structure that focuses the light rays falling on the retina."⁶ The lens is important on the process of accommodation. It means when we focus a distant object our lens get thinner or flatter, while when we

look at a close object, the lens gets rounder, to make a better image.

Pupil - The pupil controls the light which enters into the eye. "The pupil is the opening in the center of the iris that helps regulate the amount of light passing into the rear chamber of the eye."⁷ In bright light, the pupil constricts and in dim light it dilates to create a better image in the retina.

Iris - "The Iris is the coloured structure on the surface of the eye, surrounding the pupil."⁸ The Iris makes muscles surrounding the pupil wide or narrow to control the amount of light that enters to the eye.

Retina - "The retina is a layer of visual receptors covering the back surface of the eyeball."⁹ "The retina is the neural tissue lining the inside back surface of the eye; it absorbs light, processes images, and sends visual information to the brain."¹⁰ The retina is very crucial on visual perception. It contains visual receptors called the cones and the rods."Cones are visual receptors for colours and day light visual acuity. Rods are visual receptors for dimlight that produce only black and white sensations."¹¹ Usually humans have 100-125 million rods and 5 to 6.4 million cones.

Fovea - Fovea makes clear vision of humans. "The fovea is tiny spot in the center of the retina that contains only cones; visual acuity is greatest at this spot."¹²

Blind spot - The blind spot is located at optic disk and it contains only rods. Therefore, images that fall on this blind spot cannot identify clearly. However, when a part of an image falls on this, the brain fills the missed part automatically, for a clear vision.

Optic nerve - The optic nerve is the converter the visual information that falls on retina to the brain.

Those parts of the two eyes work together to make visual perception basically. First, when we look at an image it enters into the eye through the cornea and the pupil and the lens. The iris and the ciliary muscle make wide or narrow the pupil to regulate the amount of light into the eye. Then the image we look at make an up-down image in the rear chamber of the eye, called the retina.

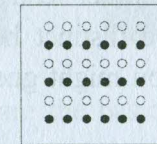
The rods and the cones process as visual receptors and distinguish visual information in daylight and dim light scenes. "The receptive field of a visual cell is the retinal area that, when stimulated, affects the firing of that cell."¹³ After the firing of cells with visual information, retinal cells send information towards the brain.

Behind the each eye there is an optic nerve combined to the retina that sends signals to the brain. These two optic nerves meet at the optic chiasm and then transfer to the thalamus which distributes all sensory information to specific areas of the brain. The thalamus then sends visual information into the occipital lobe that make up the primary visual cortex. This primary visual cortex perceives visual sensations with the help of two streams named Ventral Stream (The Perception of form and colour) and Dorsal stream (the perception of motion and depth). That is the basic process of visual perception according to western Biopsychologists.

In addition to this explanation of visual perception, Gestalt psychology came up with new findings and researches on visual perception. They have found out four major types of visual perception.

01. Element of Proximity

This element of proximity emphasizes that humans perceive things those are near to each other keeping in a one specific group. "All other things being equal, stimuli that are near each other tend to be grouped together."¹⁴ A mobile number you often memorize according to this element.



02. Element of Closure

This element represents the idea that humans perceive specific figures despite of deficiencies of them. "People often group elements to create a sense of closure, or completeness, even though figures actually have gaps in them."¹⁵ For an example, what are these? You might answer a circle or a rectangle.



03. Element of similarity

Figures that are equal to each other tend to be grouped together by humans accordingly. "Stimuli that are similar in size, shape, colour or form tend to be grouped together"¹⁶ For an example, people perceive this image as rows of circles and quadrangles.



04. Element of continuity

Figures that kept in an order tend to be grouped together. Time and space must be distinct here to perceive it with element of continuity. You might guess the next circle what would be.



In addition to these elements, Gestalt psychologists suggested two theories on visual perception. Those are;

- 1) Theory of figure and ground
- 2) The concept of whole

Theory of figure and ground concerns with images and their backgrounds. According to this theory the important facts of visual perception are figure and its background. These are some controversial images they have introduced.



The concept of whole represents the idea that "the whole is different from some of its parts". Visual Perception is based on the whole accordingly. Images below make different perceptions when we perceive them as parts or as a whole.



These explanations are the basic assumptions of western psychology on visual perception.

Visual perception in Buddhist Psychology

Buddhist psychology explains visual perception at a cognitive point of view entirely. The term "sañña" is referred to perception primarily which is based on external stimulus. Visual perception is called "rūpa sañña" in Buddhism. Basically the sañña means the identification of stimulus which comes from six organs named the eye, the ear, the nose, the tongue, the body and the mind. The touching of the five aggregates is very important here to understand basic features of perception especially of visual perception.

1. Rūpa (physical factor)
2. Vēdanā (feeling)
3. Sañña (perceptions, that is sense impressions, images or ideas and concepts)
4. Sankhāra (mental formations or conative ideas and their concomitants)
5. Viññana (consciousness)¹⁷

This is a great and deep teaching of entire mental process and the perception is only one of these components which form the understanding of external mental and physical characteristics and stimulus. "The aggregate of perception (saññākkhandha), the function of perception in Buddhist psychology is recognition (sañjānana) of objects, both physical and mental. Perception, like feeling, also is six-fold: perception of forms, sounds, smells, tastes, bodily contacts and mental objects."¹⁸

Primarily, The Mahāhattipadōpama sutta represents three factors that need to complete visual perceptual function.

1. Ajjhattikan chakkhun aparibhinnan hōti (A healthy eye)
2. Bāhirā ca rūpan āpātan āgaccati (contact of the eye and external object)
3. Tajjōva samannahārō hōti¹⁹ (paying attention or thinking)

The Lord Buddha explained visual perception from psychological point of view in various suttas. In addition to the Lord Buddha, there is a very effective teaching of visual perception, which is almost rational, presented by one of his follower Arahat Maha Kacchayana in his doctrine of Madhupindika sutta at Majjhima Nikaya. There is a great emphasis on visual perception of Buddhist psychology as many scholars suggest.

"chakkuñcāwusō paticca rūpē ca uppajjati chakkhu
Viññanam, tinnan sangati phassō, phassa paccayā
Vēdanā, yan vēdēti tan sanjānāti, yan sanjānāti tan
vitakkēti, yan vitakkēti tan papancēti, yan papancēti
tatōnidānan purisan papañcasaññāsankhā

samudācaranti atītānāgatapaccupannēsu
chakkhuviññeyyēsu rūpēsu."²⁰

In addition to this explanation, the Abhidhammattasangaha represents another deep doctrine on visual perception which focus on the cognitive process of mind during the sensation and perception of visual phenomena. There are 17 steps of the visual perception recognized by the Lord Buddha that starts and ends in sequence at a moment. This teaching of Buddhism on visual perception is very distinct and distinguished. This might be a great reveal of mental process of visual perception that opens a different way to understand sensation and perception with a combination of biological views. Those 17 steps are;

1. Bhavanga
2. Bhavangachalana
3. Bhavangupacchēda
4. Pañcadvārāvajjana
5. Chakkhuviññana
6. Sampaticcana
7. Santīrana
8. Vottapana
9. Javana 1
10. Javana 2
11. Javana 3
12. Javana 4
13. Javana 5
14. Javana 6
15. Javana 7

16. Thadārammana 1

17. Thadārammana 2²¹

This process of visual perception has been explained with a simile of a mango clearly. "The simile given by Sumangala to illustrate the process is the same mango simile with a very slight alternation. A man sleeps with his head covered under a mangotree the fruits of which are ripe (bhavanga); a ripe fruit falls (pasādaghattana, bhavangacalana); he awakes (āvajjana, bhavangupacchēda); he removes the covering of his head and looks at the fruit (chakkuviññana); he takes the fruit (sampaticchana); squeezes it (santīrana), smells it (vavatthapana), and eats it (javana); what remains in the mouth he swallows with the saliva (tadārammana).²²

Visual perception; A comparison between Buddhist and western psychology

The emphasis of visual perception in western psychology is entirely physical as described in this article. However Gestalt psychology deeply concerns with some important aspects of visual perception rather than bio psychologists. It is almost a cognitive explanation in the course of western psychology.

Buddhist psychology of visual perception is almost always a psychological description when compared to western psychology. As described in Madhupindika sutta, the visual perception is a result of a combination of two factors.

chakku (eye) + Rūpa (images) → chakku viññana (Visual Perception)

The chakku means not the external organ "the eye", but the strength of eye or the ability of eye to process on visual phenomena. Rūpa means external stimulus or images. With a

combination of these two factors, visual perception (chakku viññana) is arisen. "The word viññana in this formula is often interpreted to mean cognition in the sense of complete perception of the external world."²³

According to the text of the Madhupindika sutta visual perception contains both a simple and a complex process. "Buddhist regarded perception as a complicated process, beginning from a simple sensation and proceeding by degrees to a discriminative apprehension of the object. The first part of the formula refers only to a part of this process. Knowledge comes later."²⁴

Beyond the visual perception (chakku viññana), with a combination of those three factors the eye, object and visual perception, sense (phassa) is originated. Sense generates the feeling (Vēdanā). Feeling encourages perceiving (sañjānana). Then sequent reasoning and making phenomena are originated.

Here, the word "sañjānana" (feeling) must be discussed deeply. Madhupindika sutta emphasizes this feeling may be a thought of pleasure, displeasure or null of pleasure or displeasure (suhka, dukkha, adukkhamasukha). Lay people capture those feelings as permanents. But Arahath people who attained the ultimate happiness (nibbāna) don't take them permanent and pleasure or displeasure.

Padmal Silva describes this complex function of visual perception, "what one perceives one reasons about, what one reasons about, one turns into papañca. What one turns into papañca, because of that factor, assails him in regard to material shapes recognizable by the eye belonging to the past, the future and the present....."²⁵

The distinction of Buddhist view of visual perception is based on the deep explanation of its function that happens after perceiving visual objects. The final function of this process is called 'papañca'. This papañca is originated only within lay people who capture visual perceptions with lust, desire or craving. "The P.T.S Dictionary gives two meanings to the word 'papañca', one 'obstacle, impediment, a burden which causes delay', and the other, 'illusion, obsession, hindrance to spiritual progress.' It has also been translated variously as desire, delay, delusion and even personality."²⁶

The explanation of Abhidhammattasanhaga is also a great teaching on visual perception. It shows how our mental process works when we perceive something. Those 17 steps of visual perception arise quickly at a particular moment.

When we compare the concept of visual perception of Buddhist and Gestalt psychology, we can point out that Gestalt psychology reveals only a limited idea on visual perception. The teachings named "the concept of whole" and "the concept of figure and background" are only two types of visual perception. They have not identified even the biological process of visual perception. Buddhist ideas on visual perception are very much rich and logical when compared to Gestalt ideas on it.

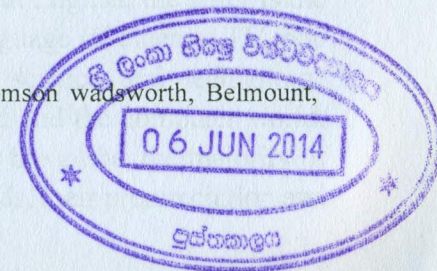
Furthermore, Buddhism uses visual perception as some kinds of meditations to concentrate the mind. In concentrative meditations (samata bhawanā) contains the Tenfold concentrative elements (dasa kasina) that uses to concentrate, purify and clear the mind.

Finally, when we compare these both streams of Buddhist psychology and western psychology on the topic of visual perception, on the one hand western psychology mainly

concerns with biological process of visual perception which starts from the cornea and ends within the primary visual cortex of the occipital lobe in the brain, while Gestalt psychologists come up with a cognitive view of visual perception using some kinds of controversial images, on the other hand Buddhist psychology mainly emphasizes a psychological perspective on visual perception entirely, which is more distinct, deep, reasonable, subjectively tight and distinguished in the course of the history.

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