

Course-CC-5 (Cognitive Psychology) Unit 1; Sem II

By

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PERCEPTION OF DEPTH AND DISTANCE

Distance or depth perception is important in our daily life. For example., when we drive, we use depth to assess the distance of an approaching automobile when we decide to call a person walking down the street , we determine the loudness with which tto call. The process of viewing the world in three dimensions (3d)is called distance or depth perception.

The apparent size, position ,distance ,depth and depth of object which reflect light on to the retina are judge in terms of variety of cues some being physiological and some are psychological. These cues are divided into two broad categories:-

- (a) Monocular cues
- (b) Binocular cues

MONOCULAR CUES(PSYCHOLOGICAL CUES)

Monocular cues as the name suggests are cues for depth that operates when only one eye is on

looking. They were first discovered by Ancient Greek and then the Renaissance, who are concerned with the problem of giving depth to the paintings. A cue depending upon the correlates in the visual image are designated psychological while those arising from the structure and movement of the eyes are called pictorial cues. Since the pictorial cues are as effective whether we use one eye or both eyes they are e.g. of pictorial cues.

These cues are often used by artists to induce depth in two dimensional paintings. Hence, they are also known as pictorial cues.

Relative size

As the objects get away the retinal image becomes smaller and smaller. We tend to perceive an object farther away when it appears small, and closer when it appears bigger.

Monocular Cues

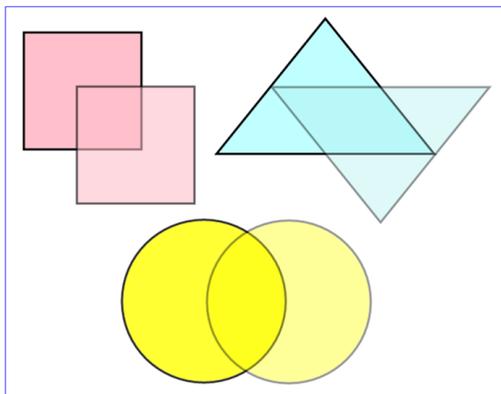
Relative Size: If two objects are similar in size, we perceive the one that casts a smaller retinal image to be farther away.



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Overlapping or interposition

These cues occur when some portion of the object is covered by another object. The overlapped object is considered farther away whereas the object that covers it appears nearer.



Linear perspective

In this cue distant objects appear to be closer together than the nearer objects. For e.g. parallel lines such as rail tracks appear to converge with increasing distance with a

vanishing point at the horizon. The more the lines converge, the farther away they appear.



Aerial perspective

The air contains small particles of dust and moisture that makes distant objects look hazy or blurry. This effect is called aerial perspective. For e.g. distant mountains appear blue due to the scattering of blue light in the atmosphere whereas the same mountains are perceived to be closer when the atmosphere is clear.



Relative height

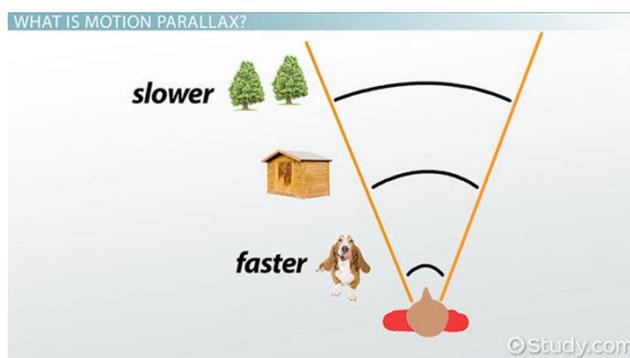
Larger objects are perceived as being closer to the viewer and smaller objects as being farther away.

Texture gradient



Motion parallax

It is a kinetic monocular cue. It occurs when objects at different distances move at a different relative speed. The distant objects appear to move slowly than the objects that are close. For eg. When we travel in a train closer objects move “against” the direction of the train, whereas the farther objects move “with” the direction of the train.



BINOCULAR CUES

Retinal or Binocular disparity

Retinal disparity occurs because the two eyes have different locations in our head. This distance is about 6.5cm. Because of this distance, the image formed in the retina of each eye of the same object is slightly different. This difference between the two images is called Retinal disparity.

The disparity is less for distant objects and more for the nearer objects.

Accommodation

Accommodation refers to a process by which we focus the image on the retina with the help of ciliary muscle. This muscles change the thickness of the lens of the eye. If the object gets away, the muscle is relaxed. As the objects moves nearer the muscle contracts and the thickness of the lens increases.

Convergence

When we see a nearby objects our eyes converts inward in order to bring image on each eye. The degree of conversion decreases as the objects moves further away from the observer. The more your eyes turn inwards or converge the nearer the object appears in space.