

Perception away the
object, the more
blurred or



Perception of depth is possible due to certain mechanisms in our eyes which psychologists call cues of depth perception. The various cues of depth perception may broadly be divided into two groups: (1) Monocular cues of depth perception. (2) Binocular cues of depth perception. We would discuss these cues in brief.

1. Monocular Cues of Depth Perception:

By monocular cues we mean, information that can be received about depth-perception even if only one eye is seeing. Most artists and painters are aware of such cues and often make use of them to produce three-dimensional effects in their painting. The following are some of the important monocular cues: (i) Linear Perspective: Objects which are far away throw a relatively smaller image on the retina compared to those which are nearer. The best example of linear perspective is that of railroad track; we feel as if the two parallel tracks are almost merging with each other at some distance. The reason is that the image cast by the distance between the tracks becomes smaller and smaller in angle or visual angle. This supplies us with one of the most important cues for depth perception.

(ii) Clarity: The nearer the object, the clearer it is, the further away the object, the more blurred or unclear it is, e. g., when we look at a landscape, the distant mountains and rivers look hazy and blurred, while the nearer objects look clearer. Any impression of clarity or haziness can serve as an important cue to know whether an object is near or further away from us. (iii) Interposition: This is another monocular cue which occurs when one object obstructs our view of another object.

When one object is completely visible while another is partly covered by it, the first object is perceived as being nearer. (iv) Shadow: The pattern of shadows and light is another very important cue in depth perception. Other things being equal, shadowed objects are usually judged to be further away than lighted objects. This is true of dark colours at a great distance.

Knowledge of the source of light and its direction may serve as a cue in depth perception. For example; if a light is coming from behind or any side of an observer, the shadows it may cast may give him some cue of depth.

Because of our great experience with such things, even the perception of shadows and light can give us an idea of distance.(v) Gradient of Texture: A gradient may be defined as a graded or continuous change which is not abrupt or sudden. The gradient of texture of a visual field may often, though not always, furnish us with a cue for depth, because the object which are nearer to the observer have a coarse texture, which may actually become smoother and smoother as the distance between the object and the observer increases. For instance, if one is looking upward at a brick building, the texture of the upper part would appear to be finer because of the distance from the eye, that is, the bricks look lightly packed, hence denser than those at the eye level. (vi) Head Movement: The movement of the head often provides us with fine depth cues. This is often referred to as parallax or a change in the perceived object as a result of an observer's movement. It could be either monocular parallax or binocular parallax. The monocular parallax refers to the change caused by the movement of only one eye.

If you close one of your eyes and move your head, you perceive slightly different view of the scene, which may give some indication of depth. In

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monocular parallax, the objects nearer to an observer moves faster and in the opposite direction as compared to those which are at some distance from him. In binocular parallax also the same thing happens, but the nearer objects don't move as fast as they do in monocular parallax. Such information is often useful in judging distance objects. (vii) Accommodation: The shape of the lens of the eye changes in order to produce a sharp image on the retina. For near objects the lens bulges, for far objects it flattens. This is called accommodation.

These changes are initiated by the ciliary muscles surrounding the lens. Kinesthetic receptors in these muscles detect tension when the eye is viewing near objects but none when it is viewing from afar. Accommodation is a useful cue to distance only when the object at which we are looking is fairly nearer. Beyond three or four feet, accommodation is relatively unimportant.

Accommodation is a monocular cue; the lens of one eye will focus whether or not the other eye is being used. (viii) Distance from the horizon: If other monocular cues are missing, the distance from the horizon can tell you how close or far away the objects are. The objects which are close to the horizon are further away than the objects which are far from the horizon.

2. Binocular Cues of Depth Perception:

When both the eyes are being used in the perception of an object or distance it is called binocular perception. Experimental studies carried out in a wide variety of setting have demonstrated that binocular cues of depth perception lead to more accurate vision than the monocular cues of depth perception.

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The most important binocular cues of depth perception are as under: (a)

Retinal disparity: The two eyes are located a little away from each other.

Therefore, each eye gets a little different picture of the same object. The left eye can see a little more of the left side of the object than the right eye. This difference in view is called retinal disparity. In other words, retinal disparity is the difference in the images falling on the retinas of the two eyes. Each eye gets a little different view of the object.

When the two views are compounded to form a single scene, the overlap between the two views gives us the sensation of depth. (b) Convergence:

When we are looking at an object which is close to us, the eyes converge or move more toward each other. When the object is more than 20 meters away, the lines of the sight of the two eyes are almost parallel. The greater the convergence, the greater the tension in the muscles of the eyes. The sensory impulses from the muscles of the eyes going to the brain give us a cue to depth. However, the value of his cue is doubled by many psychologists, especially when the objects are far away from us.