

NCERT Solutions for Class 11

Psychology Chapter 5

Sensory, Attentional, and Perceptual Processes

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Q1 :

Explain the functional limitations of sense organs.

Answer :

The functional limitations of sense organs of human beings refer to their limited range of stimulation. In order to be noticed, a stimulus has to be of an optimal intensity and magnitude. Thus, the stimulus has to carry a minimum value or weight. For example, our ears cannot hear very faint or loud sounds. Similarly, our eyes cannot see objects in very dim or very bright light.

Q2 :

What is meant by light and dark adaptation? How do they take place?

Answer :

Light adaptation is the process of adjusting to bright light after exposure to dim light. This process often takes a minute or two to be completed. Dark adaptation, on the other hand, refers to the process of adjusting to dim light after exposure to bright light. It may take half an hour or longer depending upon the level of exposure.

Light and dark adaptation takes place due to photochemical processes. Light adaptation takes place when the molecules of rhodopsin or visual purple in the rods of the eye get bleached or broken down, as a result of the action of light. Dark adaptation takes place when the light is removed allowing for restorative processes that regenerate the pigment in the rods with the help of vitamin A.

Q3 :

What is colourvision and what are the dimensions of colour?

Answer :

Colour vision is the ability of the eyes to see and distinguish between colours based upon their varying wavelengths in the visible spectrum of light. The vision of colours depends on the visible spectrum, which includes the range of energy detected by the photoreceptors. Further, the colours are a psychological property of human sensory experience. They are created by the interpretation of the information received by the brain.

The dimensions of colour are as follows:

- i. **(i) Hue** -It is a property of chromatic colours. Hue varies with wavelength and each colour carries a specific wavelength. Achromatic colours like black, white and grey do not have hues.
- (ii) Saturation** -It is a psychological attribute that refers to the relative amount of hue of a surface or object. The light of a single wavelength appears to be saturated, while the mixtures of different wavelengths cause decrease in saturation.
- (iii) Brightness** -It refers to the perceived intensity of light and varies across both chromatic and achromatic colours. White is the brightest colour, whereas black is the least bright colour.

Q4 :

How does auditory sensation take place?

Answer :

Auditory sensation takes place when sound enters the ear and stimulates the chief organs of hearing. This involves the production of cyclical displacements of molecules in the air. Auditory sensation refers to a subjective hearing of something, and audition is an important sense modality, as it provides spatial information and plays an important role in spoken communication.

Q5 :

Define attention. Explain its properties.

Answer :

Attention refers to the process through which certain stimuli are selected from a group of others. It requires an allocation of effort. The objects that are at the centre are the focus of attention while objects that are away from the centre are at the fringe.

Attention has following properties:

- i. **(i) Alertness:** It refers to the individual's readiness to deal with stimulus that they experience. For instance, the situations where people are alert while crossing the road in order to avoid mishaps.
- (ii) Concentration:** It refers to the focus of awareness on specific objects while excluding others in that period of time. For instance, the executives in a meeting concentrate upon their work while ignoring other activities outside.
- (iii) Search:** It takes place when an observer looks for specific subset of objects among a set of objects. For example, the historians search for sites to gain information about events within a particular time period.
- (iv) Selection:** It refers to the focus of conscious awareness on a particular stimulus, upon which the attention is gained.

Q6 :

State the determinants of selective attention. How does selective attention differ from sustained attention?

Answer :

The determinants of selective attention are following:

- i. **(i) The external factors:** These are the features of stimuli such as size, intensity, shape etc.
- (ii) The internal factors:** These are present within the individual and can be divided into motivational factors and cognitive factors.
 - Motivational factors represent our biological and social needs. Instances of the same are the drivers strictly following all the traffic rules.
 - Cognitive factors represent interests, attitude and preparatory set. For instance, an average teenager would be more interested in watching a cricket match than reading a novel.

Selective attention differs from sustained attention as sustained attention is primarily concerned with concentration and refers to the ability to maintain attention on an object for even for long duration. Contrary to this, selective attention is related to the selection of a limited number of stimuli from a larger group of stimuli.

Q7 :

What is the main proposition of Gestalt psychologists with respect to perception of the visual field?

Answer :

The main proposition of Gestalt psychologists with respect to perception of the visual field is that humans perceive different stimuli as an organised "whole", which carries a definite form. According to them, the form of object lies in its whole that is different from the discrete parts. The Gestalt psychologist also believes that human perceive everything in an organised form because of the orientation of cerebral processes towards a pragnanz.

Q8 :

How does perception of space take place?

Answer :

Space is perceived in three dimensions. This is because of the ability to transfer a two-dimensional retinal vision into a three dimensional perception. Spatial attributes of objects like size, shape and direction, and the distance between objects also contribute towards the perception of space. While the images of objects projected on the retina are flat and two dimensional, it is possible to perceive them in three dimensions by transferring the two-dimensional retinal vision into a three-dimensional perception.

Q9 :

What are the monocular cues of depth perception? Explain the role of binocular cues in the perception of depth?

Answer :

The monocular cues of depth perception induce depth in objects when viewed through a single eye. They are also known as pictorial cues as they are used by artists to induce depth in two dimensional paintings. Important monocular cues are relative size and height, interposition, linear and aerial perspective, light and shade, texture gradient and motion parallax.

The binocular cues of depth perception are provided by both the eyes in three dimensional spaces. Their role in the perception of depth are as follows:

- i. **(i) Retinal or Binocular disparity:** It occurs when the two eyes have different locations in the head and are separated horizontally with a difference of 6.5 centimetres. The difference in the images formed by the eyes is due to retinal disparity. Large retinal disparity means a close object and small retinal disparity means a distant object.
- (ii) Convergence:** When the eyes converge inward to bring the image on the fovea of each eye, a group of muscles send messages to the brain which are interpreted as cues to the perception of depth. The degree of convergence decreases with increase in distance of the object.
- (iii) Accommodation:** It is the process through which image is focussed on the retina with the help of ciliary muscle. These muscles change the thickness of the eye lens. The degree of contraction of the muscles provides a cue to distance. The muscles relax when the object is distant and contract when the object is near.

Q10 :

Why do illusions occur?

Answer :

Illusions occur because of a result of a mismatch between the physical stimuli and its perception by the individual. The mismatch is caused by incorrect interpretation of information received by sensory organs. Illusions are called primitive organisations as they are generated by an external stimulus situation that generates the same kind of experience in all the individuals. Some illusions are universal in nature as they are found in all individuals. They are also known as universal illusions or permanent illusions because they do not change with experience and practice. Contrary to this, illusions that vary in different individuals are known as personal illusions.

Q11 :

How do socio-cultural factors influence our perceptions?

Answer :

Socio-cultural factors influence our perceptions by generating differential familiarity and salience of stimuli as well as certain habits of perception. People living in different cultural settings have varying perceptions like identification of objects and interpretation of depth. For example, in the study carried out by psychologists in Africa and Europe, it was observed that the Africans have greater susceptibility to horizontal-vertical illusions as they live in dense forests and regularly experience verticality which overestimated.

Europeans on the other hand, have greater susceptibility to Muller-Lyer illusion as they live in an environment that has right angles. Hence, they underestimate the length of lines characterised by enclosure.