



Sensory Adaptation

Sensory adaptation is the process in which changes in the sensitivity of sensory receptors occur in relation to the stimulus. All senses are believed to experience sensory adaptation. However, some experimental psychologists say that the sense of pain does not experience this phenomenon.

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Vision

In terms of the sense of sight, sensory adaptation involves dark adaptation and light adaptation. Dark adaptation refers to the changes in the sensitivity of the receptors in response to reduced light intensity. The process of dark adaptation is manifested through three changes in the visual system. First, the pupil enlarges immediately after sensing the reduction of the light stimuli (in terms of intensity). The dilation of the pupil is necessary so that more available light can enter and stimulate the retina. Second, the color receptors or cones become increasingly sensitive. Within 5 to 10 minutes of low levels of illumination, the cones achieve dark adaptation in a complete manner. Lastly, the night vision receptors or rods become increasingly sensitive.

Just like the cones, the rods have a light-sensitive chemical that concentrates more on low light environment. Rods are slower to experience dark adaptation ^[1] as compared to cones, with a span of 20 to 30 minutes. Light adaptation also includes changes in pupil size, sensitivity of cones, and sensitivity of the rods.

Generally, the changes are opposite of that in dark adaptation. The pupil becomes smaller immediately in light adaptation to allow less light to enter the eye. The cones as well as the rods become less sensitive to light. Light adaptation takes only a few seconds, occurring

faster than dark adaptation due to the nature of the photons to enter the eye rapidly in increased light intensity and destroy the excess light-sensitive chemical.

Hearing

In terms of hearing, our ears adapt to loud sound as it hits the small bones located in the inner ear. The loud sound leads the inner ear bone/s to contract. This contraction causes the reduction or delay of transmission of sound vibrations to the inner ear. Detection of the vibrations follows. However, this process of auditory adaptation usually does not work very well with loud sounds that are sudden or instantaneous. Examples of these sounds are gun shots or explosions.

Taste and Smell

Low concentrations of several chemicals present in the air can be detected by the sensory receptors in the nose. These chemicals that we quickly detect include those in perfumes or air fresheners.

Touch

Humans are able to adapt to hot and cold stimulation in a split second if the stimuli are not too extreme, such as a warm bath or a cold lake. However, very hot or very cold stimuli may destroy touch receptors, and this intense stimulation may be interpreted as pain sensation.

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users.ipfw.edu ^[1]

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