

Unit 7 Notes: Perception

Thresholds

- *threshold* (or *limen*)--the point when a psychological and/or physiological effect is produced
 - *absolute threshold*--the least amount of a stimulus needed to trigger a sensory perception (e.g. a candle at one mile away)
 - *difference threshold* (or *just noticeable difference*)--the least amount of difference between two stimuli for perception to occur

The Eye

- the structures of the eye from the diagram are as follows:
 - *lens*: focuses the image onto the retina
 - *pupil*: regulates the amount of light entering the eye; full dark adaptation takes about 30 minutes and light adaptation about 1 minute
 - *iris*: the colored part of the eye
 - *cornea*: the soft, outer, protective covering of the eye
 - *retina*: contains photoreceptor cells, rods (which detect brightness contrasts) and cones (which detect color)
 - *fovea*: an area of the retina that contains all cones and no rods
 - *optic nerve*: relays visual information to the brain
 - *blind spot*: where the optic nerve connects to the back of the eye

The Visual Cortex

- information travels from the eyes to various parts of the brain:
 - the thalamus
 - the *visual cortex* of the occipital lobe
- Hubel and Wiesel have developed the *feature detection theory*--there are certain cells in the visual cortex that are sensitive to certain features of a stimulus
- they determined there were three types cells in the visual cortex:
 - *simple*--provide information about the position and boundaries of a stimuli
 - *complex*--provide advanced information about position such as movement
 - *hypercomplex*--provide abstract information such as shape or size

Color Perception

- subtractive color mixtures deal primarily with mixing pigments (e.g. blue and yellow mixed together make green)
- additive color mixtures deal primarily with mixing lights (e.g. combining a green and red light will give you yellow)
- there are two main theories of color perception:
 - *trichromatic* (or *Young-Helmholtz theory*): all color perception derives from three different color receptors in the retina (usually red, blue and green); while this theory can physically recreate the spectrum of colors, much like your TV set does, it cannot explain color blindness or negative afterimages
 - *opponent process theory*: three sets of color receptors (blue-yellow, red-green, black-white) respond to determine the color you experience; explains both color blindness (which tends to be either blue-yellow, red-green, or full color blindness) and negative afterimages; this was proposed by Ewald Hering

Adaptation and Habituation

- *adaptation*--the process by which your sensory systems adjust to changes in the environment (e.g. light and dark adaptation)
- *habituation*--the process by which you "tune out" distracting stimuli in your environment
- *dishabituation*--the process by which you suddenly "tune back in" to new stimuli (such as someone calling your name)

Attention

- *Broadbent's filter theory*--the idea that we can selectively attend to certain stimuli and disregard other information (e.g. talking to your friend in a noisy restaurant); an all-or-nothing filter
- the *cocktail party phenomenon*--adjusts Broadbent's filter theory from an "all-or-nothing" filter to one that includes dishabituation (e.g. at the restaurant with your friend, if someone calls your name you will no longer filter out that stimuli)
- selection attention has been tested through *dichotic listening* experiments in which subjects are presented with two competing messages simultaneously and are asked to attend to only one of the messages; they are usually successful in this task

Perception Processes

- *bottom-up processing* usually involves data; it is our ability to take individual components of a stimulus and to put it together according to fixed rules into a whole pattern
- *top-down processing* usually involves concepts; it is our ability to see a whole concept and then break it down into its component parts

Perception: 2D Objects in 3D

- *superposition*--when one object overlaps another object; we see one object as being in front, one in back
- *relative size*--an object is expected to grow smaller on the retina the further away it becomes
- *linear perspective*--when two lines converge on the horizon to indicate depth or distance

Perception: Depth Perception

- *texture gradient*--objects appear sharp and textured up close but less sharp and detailed further away
- *motion parallax*--variations in motion and speed (e.g. in a car, close objects appear to whiz by but distant objects appear to be moving slower)
- *retinal disparity* (or *stereopsis*)--the slight difference in visual information taken in through both of our eyes
- *figure-ground*--the ability to separate an object or figure from its background

Perception: Gestalt Perception

- *proximity*--if objects are close to each other they are perceived as being together
- *similarity*--similar objects are typically grouped together
- *continuation*--the perception of continuous patterns that flow in the same direction and in the same manner
- *subjective contours*--seeing objects or images as outlined by their contours
- *closure*--our desire to see objects as complete, even in the absence of actual stimuli
- *law of pragnanz*--perception will always be as simple, regular and symmetrical as possible

Perception: Motion of Light

- *real motion*--this involves actually moving the light (e.g. spotlights)
- *phi phenomenon*--when lights are flashed in different locations so that they appear to be moving (e.g. theater marquees)
- *induced motion*--when it appears a light is moving but actually everything around the light is moving
- *autokinetic effect*--in a dark room a point of light appears to move because there is no frame of reference for it