



Chapter 5 – Sensation and Perception

- I. Definitions
 - a. Sensation = Early stage of perception – initial nerve impulses.
 - i. Sensory neurons (afferent)
 - ii. E.g.: Rods and cones in eyes.
 - b. Perception = Making meaning of sensory patterns (Relies on many cognitive processes – memory, expectation, etc)
 - c. Receptors = Pick up sensations
 - d. Transduction = Process to convert physical energy into neural activity.
 - i. Mechanical energy = Touch, waves, etc
 - ii. Chemical energy = Smell & Taste
 - iii. Light Energy = Electromagnetic
 - e. Empiricism = Knowledge gained through observation. No real 'observation' can occur except through perception. *Id est*, that which we perceive often doesn't exist in the physical world. Color is merely perceived.
- II. What we Perceive
 - a. Threshold = Biological Limitations
 - i. Absolute = Minimal amount of physical stimulus detectable
 1. One candle @ 30? 17? Miles
 2. One drop of perfume in a three-room house.
 3. One watch ticking from twenty feet.
 4. Bee's wing falling to cheek from one centimeter.
 - ii. Difference = Minimal noticeable change.
 1. EG: What if one candle is added? Will it still appear as only one?
 2. Weber's Law: $\Delta I = kI$ where I is the intensity of a stimulus, and k is a 'constant.'
 - iii. Attention
 1. Focusing mental processing / resources on certain portions of stimuli
 2. You must be looking in the right direction, and focusing mentally on the correct area of your vision to notice something.
 - iv. Sensory adaptation >> Perception changes with durations of exposure
 - b. Psychophysics = Relationship between external world and its perception
- III. Signal Detection Theory
 - a. Detection depends on stimulus and background.
 - b. Probability of Detection increases as a function of Probability of Stimulus where $f(x) = x$
 - c. Detection
 - i. Correct Response = Hit [Stimulus Identified when Present]
 - ii. False Alarm [Stimulus Identified when Absent]
 - iii. Correct Rejection [Stimulus Missed when Absent]
 - iv. Miss [Stimulus Missed when Present]
- IV. Visual System
 - a. Perceiving small fraction of electromagnetic spectrum
 - b. Visible light = 400 > 750 nanometers
 - c. <Refer to figure 5.2 on page 171>
 - d. Color (hue) determined by wavelength
 - e. Cone types
 - i. 435, 540, 565 / Blue, Green, Yellow-Green
 - ii. Wavelengths are not identified exclusively. Each receptor is sensitive to a full range of wavelengths, identified on a graph in the form $1/X^2$
 - f. Brain processes color, form, position, and depth
 - g. Opponent process theory of color vision: Certain wavelengths inhibit perception of certain others. Sensors 'wear out,' and the brain assumes those wavelengths are absent.
 - h. Brightness = Intensity (amplitude of wave)

- i. Stroop Test >> <http://www.utoledo.edu/~ddwyer/mgmt4780/stroop.htm>
- V. Auditory System
 - a. Perceiving frequency as pitch (20 hz > 20khz)
 - b. Perceiving amplitude as volume.