

Review Session 5 (February 3): Chapter 3

“Chapter 3: Sensation and Perception”

- Distinguish between *sensation* and *perception* by explaining the concept of *transduction*. (Important to note that without transduction, perception of our world would not be possible.)
- Distinguish between the *absolute threshold* and the *just noticeable difference (jnd)*. (Recall that the just noticeable difference is also referred to as the difference threshold.)
 - When is the *jnd* higher: while sleeping or awake?
 - _____ was developed to account for the change in a stimulus that can be subjectively noted, fifty percent of the time (this change is the *jnd*).
- Explain signal detection theory. What is its ultimate goal, in measuring sensation? (Recall that people can convince themselves of having heard or seen something, but this is not always a valid response.) As such, scientists recognize hits (accurate detection) and false alarms (inaccurate detection). (Don't worry too much about the jargon here; I'm just guiding the explanation of the theory.)
 - Define subliminal. How does it apply to sensation/perception?
- The wavelengths of the electromagnetic spectrum available to our visual capacity are called *visible light*, and the wavelengths fall somewhere between _____ nm and _____ nm.
 - Recall that a color is nothing more or less than a wavelength of visible light. We see the light reflected off surfaces. In other words, we see wavelengths of the light reflected off surfaces.
 - Recall that **red** has the longest wavelength of visible light; **violet** has the shortest wavelength of visible light.
- Be able to label the basic anatomical features of the human eye. Provide a brief description of the function of each of these parts: i) cornea, ii) pupil, iii) iris, iv) lens, v) retina, vi) optic nerve. (The optic nerve is a highly important component, but it of course extends to the brain, so it is not exclusively found in the eye.)
 - What are photoreceptors? What are the two types found in the retina? Which of these two is responsible for color vision?
 - Explain the process of transduction in the eye. (Begin with light hitting the retina. What is chemically split apart? This changes what, which fire to the brain? This entire process is responsible for *visual perception*.)
 - What are the 3 primary colors?
 - Distinguish between *trichromatic color* theory and *opponent-process* theory.
 - Recall that opponent-process theory was developed to explain what trichromatic color theory could not. What is that?
 - Define *contralateral*. How does it apply to visual processing?

- Through which structures does visual information pass, before arriving at the visual cortex of the occipital lobe?
- As with vision, audition involves the detection of wavelengths, but of *sound* waves.
 - Define frequency, as it applies to these waves. Higher pitch is a consequence of higher _____.
 - Greater pressure on the eardrum (i.e. greater amplitude of sound waves) results in greater _____ detected by the ear.
 - Be able to label the basic anatomy of the human ear. Provide a brief description of the function of each of these structures: i) pinna, ii) ear canal, iii) eardrum, iv) ossicles (i.e. hammer, anvil, stirrup), v) oval window, vi) cochlea (includes hairs along the basilar membrane; don't be concerned with recalling the basilar membrane, but it is convenient to know where the hairs are located); vii) auditory nerve (extends to the auditory cortex of the temporal lobe of the brain)
 - Recall that the ear drum terminates the outer ear; the oval window, the middle ear; and the auditory nerve, the inner ear.
- Distinguish among *place theory*, *frequency theory (including volley theory)*, and *duplicity theory* of audition.
 - It is important to note that volley theory developed directly from frequency theory, which is why learning one implies learning the other. Volley theory is more or less an update of frequency theory, to explain how the ear detects sound frequencies exceeding 1,000 Hz. Note that duplicity refers to two.
- Differentiate between papillae and taste buds. Which are actually responsible for the detection of taste (e.g. bitter, sweet, sour, and salty)?
 - True or false: Taste diminishes with age.
- The process of lock and key refers to neurotransmitter binding between neurons, as well as to the binding of odorants (particles that we smell) to receptors in the olfactory epithelium.
 - Where is the olfactory bulb located?
 - True or false: Smell diminishes with age.
- List the two broad divisions of the skin. Note that there are receptors located in both, which are responsible for the sensation of touch.
 - Recall that these touch receptors are not present in surfaces devoid of hair (notice how your lips are much less sensitive than other regions; of course, the lips still detect pressure and pain).
- Define kinesthesia.
- What is the vestibular sense? What structures in the ear are responsible for this sense?
- Distinguish between *bottom-up* and *top-down* processing.
 - Note that bottom-up can be thought of as “working from the bottom or from scratch.”
- Define perceptual constancy and give two examples (see page 117).

- Distinguish between monocular cues and binocular cues, which are responsible for depth perception.
- Define *Gestalt*. How does this term apply to perception? List the five Gestalt principles associated with perception.
 - _____: bring item of interest to the front
 - _____: group items that are related
 - _____: group items that are near one another
 - _____: find a pattern
 - _____: fill in gaps to make a composite
- Neurons fire in response to specific stimuli (e.g. colors and shapes). This process is called _____, and it is a neurological explanation for form perception.