**SENSATION AND PERCEPTION**

**Sensation & Perception -** When we smell a fragrant flower, are we experiencing a sensation or a perception? In everyday language, the terms "sensation" and "perception' are often used interchangeably.

However, as you will soon see, they are very distinct, yet complementary processes. In this section, we will discuss some concepts central to the study of sensation and perception and then move on to discuss vision and the perception of pain (it is not possible in the scope of these notes to discuss all the senses).

I. Sensations and Perceptions

**Sensations** can be defined as *the passive process of bringing information from the outside world into the body and to the brain.* The process is passive in the sense that we do not have to be consciously engaging in a "sensing" process. **Perception** can be defined as *the active process of selecting, organizing, and interpreting the information brought to the brain by the senses.*

A) HOW THEY WORK TOGETHER:

1) Sensation occurs:

a) sensory organs absorb energy from a physical stimulus in the environment.

b) sensory receptors convert this energy into neural impulses and send them to the brain. (**transduction)**

2) Perception follows:

a) the brain organizes the information and translates it into something meaningful.

B) But what does "meaningful" mean? How do we know what information is important and should be focused on?

1) **Selective Attention** - process of discriminating between what is important & is irrelevant (Seems redundant: selective-attention?), and is influenced by motivation. This can lead to **change blindness** and **selective inattention—**failing to recognize changes and objects in an environment because of your attention being elsewhere

For example - students in class should focus on what the teachers are saying and the overheads being presented. Students walking by the classroom may focus on people in the room, who is the teacher, etc., and not the same thing the students in the class.

2) **Perceptual Expectancy/Perceptual Set**- how we perceive the world is a function of our past experiences, culture, and biological makeup. For example, as an American, when I look at a highway, I expect to see cars, trucks, etc, NOT airplanes. But someone from a different country with different experiences and history may not have any idea what to expect and thus be surprised when they see cars go driving by.

Another example - you may look at a painting and not really understand the message the artist is trying to convey. But, if someone tells you about it, you might begin to see things in the painting that you were unable to see before.

3) **Sensory adaptation –** diminished sensitivity as a consequence of constant stimulation

Examples – adjusting to living/working in a smelly environment, adjusting to lightness/darkness, having on a watch for a while and not noticing

II. Processing

1. **Bottom-up processing**: analysis that begins with the sensory receptors and works up to the brain’s integration of sensory information
2. **Top**-**down processing:** information processing guided by higher-level mental processes, as when we construct perceptions drawing on our experience and expectations

III. Thresholds

**Thresholds for Human Senses**

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| --- | --- | --- | --- |
| **Sense** | **Stimulus** | **Receptors** | **Absolute Threshold** |
| Vision | Electromagnetic energy | Rods and cones in the retina of the eye | A candle flame viewed from a distance of about 30 miles on a dark night |
| Hearing | Sound waves | Hair cells of the inner ear | The ticking of a watch from about 20 feet away in a quiet room |
| Smell | Chemical substances in the air | Receptor cells in the nose | About one drop of perfume diffused throughout a small house |
| Taste | Chemical substances in saliva | Taste buds on the tongue | About 1 teaspoon of sugar dissolved in 2 gallons of water |
| Touch | Pressure on skin | Nerve endings in the skin | The wing of a fly falling on a cheek from a distance of about 0.4 inch |

A) **Signal detection theory** predicts how and when we detect the presence of faint stimulus amid background stimulation. This theory assumes that there is no single **absolute threshold** and that detection depends partly on a person’s experience, expectations, motivation and altertness. Any stimuli you cannot detect 50 percent of the time is called **subliminal**. Subliminal stimuli can be used to **prime** our perceptions by activating certain associations and predisposition.

**B) Difference threshold** is the minimum difference a person can detect between any two stimuli half of the time. Example – Adding 1 ounce to a 10 ounce weight causes you to detect a difference. **Weber’s Law** states that, to be perceived as different, two stimuli must differ by a constant minimum percentage (not a constant amount).