**Sensation**

Sensation is the activation of the sense organs by a source of physical energy. Sensation is input about the physical world obtained by our sensory receptors, and perception is the process by which the brain selects, organizes, and interprets these sensations.

**Perception**

Perception is the sorting out, interpretation, analysis, and integration of stimuli carried out by the sense organs and brain.

**Stimulus**

stimuli are those actions, acts, or procedures that evoke a reaction from the human mind.

A stimulusis any passing source of physical energy that produces a response in a sense organ. Stimuli vary in both type and intensity. Different types of stimuli activate different sense organs. For instance, we can differentiate light stimuli (which activate the sense of sight and allow us to see the colors of a tree in autumn) from sound stimuli (which, through the sense of hearing, permit us to hear the sounds of an orchestra).

In addition, stimuli differ in intensity, relating to how strong a stimulus needs to be

before it can be detected.

Questions of stimulus type and intensity are considered in a branch of psychology

known as psychophysics.

**Psychophysics** is the study of the relationship between the physical aspects of stimuli and our psychological experience of them. Psychophysics played a central role in the development of the field of psychology.

**Absolute Thresholds: Detecting What’s Out There**

Just when does a stimulus become strong enough to be detected by our sense organs? The answer to this question requires an understanding of the concept of absolute threshold. An absolute threshold is the smallest intensity of a stimulus that must be present for it to be detected.

**Absolute Threshold**

Despite the “absolute” in absolute threshold, things are not so cut and dried. As the strength of a stimulus increases, the likelihood that it will be detected increases gradually. Technically, then, an absolute threshold is the stimulus intensity that is detected 50% of the time. It often takes a very small stimulus to produce a response in our senses. For example, the sense of touch is so sensitive that we can feel a bee’s wing falling on our cheeks when it is dropped from a distance of 1 centimeter.

In fact, our senses are so fine-tuned that we might have problems if they were any more sensitive. For instance, if our ears were slightly more acute, we would be able to hear the sound of air molecules in our ears knocking into the eardrum—a phenomenon that would surely prove distracting and might even prevent us from hearing sounds outside our bodies.

**Difference Thresholds: Noticing Distinctions Between Stimuli**

Suppose you wanted to choose the six best apples from a supermarket display—the biggest, reddest, and sweetest apples. One approach would be to compare one apple with another systematically until you were left with a few so similar that you could not tell the difference between them. At that point, it wouldn’t matter which ones you chose.

Psychologists have discussed this comparison problem in terms of the difference threshold , the smallest level of added (or reduced) stimulation required to sense that a change in stimulation has occurred.

**just noticeable difference**

The difference threshold is the minimum change in stimulation required to detect the difference between two stimuli, and so it also is called a **just noticeable difference.**

**Weber’s law**

Weber’s law states that a just noticeable difference is a *constant proportion* of the intensity of

an initial stimulus (rather than a constant amount).

For example, If the volume of a television is high, turning it down by a few decibels will not be a very big difference.

When you start with 50 cans of soda, the sample size is large, if someone drinks a soda it will be harder to notice a missing soda. As the sample size gets smaller, 2 cans, when someone drinks a soda it is easier to notice a soda missing.

When a tree changes color in winter and becomes really bright (such as the one on our school grounds), it's still changing color daily but it is harder to notice than when it was a less intense color.

**Sensory Adaptation: Turning Down Our Responses**

You enter a movie theater, and the smell of popcorn is everywhere. A few minutes later, though, you barely notice the smell. The reason you become accustomed to the odor is sensory adaptation. **Adaptation** is an adjustment in sensory capacity after prolonged exposure to unchanging stimuli. Adaptation occurs as people become accustomed to a stimulus and change their frame of reference.

One example of adaptation is the decrease in sensitivity that occurs after repeated exposure to a strong stimulus. If you were to hear a loud tone over and over again, eventually it would begin to sound softer. Similarly, although jumping into a cold lake may be temporarily unpleasant, eventually you probably will get used to the temperature.

This apparent decline in sensitivity to sensory stimuli is due to the inability of the sensory nerve receptors to fire off messages to the brain indefinitely. Because these receptor cells are most responsive to changes in stimulation, constant stimulation is not effective in producing a sustained reaction.

Judgments of sensory stimuli are also affected by the context in which the judgments are made. This is the case because judgments are made not in isolation from other stimuli but in terms of preceding sensory experience. You can demonstrate this for yourself by trying a simple experiment:

Take two envelopes, one large and one small, and put 15 nickels in each one. Now lift the large envelope, put it down, and lift the small one. Which seems to weight more? Most people report that the small one is heavier, although, as you know, the weights are nearly identical. The reason for this misconception is that the visual context of the envelope interferes with the sensory experience of weight. Adaptation to the context of one stimulus (the size of the envelope) alters responses to another stimulus (the weight of the envelope)