

LECTURE 07: PERCEPTUAL PROCESSES

A) PERCEPTION AND SENSATION

Introduction

We have a number of different senses, including vision, hearing, taste, smell, touch, pain and kinaesthesia (body position and movements). Each of these senses provides information in the form of a different kind of energy. When we 'sense' something, we are actually detecting and responding to physical stimuli — information which is in the form of a specific kind of energy and has stimulated receptor cells. It is not until we 'perceive' the information that we have interpreted and assigned meaning to the information.

Most of the sensory information ('stimuli') comes from our external environment; for example, light (for vision), air vibrations (for hearing) and chemical molecules (for taste and smell). Other sensory information comes from sensory receptor sites within our body, such as from muscle tendons and joints (for kinaesthesia). All human sensory systems, also called perceptual systems, have many characteristics in common. This includes a similar sequence of information processing for detecting and responding to stimuli through sensation and perception. In this chapter we examine the two distinctive processes of sensation and perception using vision and taste (gustation) as examples of human sensory systems. Vision is the sense on which most people are most reliant and taste is the least crucial but the most multisensory

of our perceptual experiences. We will consider how biological, psychological and social factors can influence our perception of visual and taste stimuli.

Distinction Between Sensation and Perception

Sensation is the process by which our sense organs and receptors detect and respond to sensory information that stimulates them. The information at this stage is simply raw sensory data. It is meaningless until it is sent to the relevant sensory area in the brain for processing. Perception refers to the process by which we give meaning to sensory information. This processing results in the conscious experience of our external (and internal) environments. The essence of perception is interpreting sensations. Our sensory systems 'translate' the sensations into information that is meaningful and useful. Most of the time we process sensory information automatically, without realising that we are doing it. However, perception is not a passive process. It does not work like a camera or recorder, digitally capturing information. **Perception** is an active process. What we see, taste, hear, smell and so on is the result of brain activity that constructs our personal understanding of reality from raw sensory information. This allows us to adapt to our environments and function in everyday life as we do. Psychologists often distinguish between sensation and perception. This is mainly done for the purposes of study. There is actually no clear boundary that identifies where sensation ends and where perception begins. Perception includes sensory processes and involves the entire sequence of events that begins with the detection of a stimulus (sensation) through to interpretation of the stimulus.

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.

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.

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 - 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.

ALL OF THIS IS CALLED Psychophysics

C) Psychophysics can be defined as, *the study of how physical stimuli are translated into psychological experience.*

In order to measure these events, psychologists use THRESHOLDS.

1) Threshold - a dividing line between what has detectable energy and what does not.

For example - many classrooms have automatic light sensors. When people have not been in a room for a while, the lights go out. However, once someone walks into the room, the lights go back on. For this to happen, the sensor has a threshold for motion that must be crossed before it turns the lights back on. So, dust floating in the room should not make the lights go on, but a person walking in should.

2) Difference Threshold - the minimum amount of stimulus intensity change needed to produce a noticeable change.

The greater the intensity (ex., weight) of a stimulus, the greater the change needed to produce a noticeable change.

For example, when you pick up a 5 lb weight, and then a 10 pound weight, you can feel a big difference between the two. However, when you pick up 100 lbs, and then 105 lbs, it is much more difficult to feel the difference.

3) Signal-Detection Theory - detection of a stimulus involves some decision making process as well as a sensory process. Additionally, both sensory and decision making processes are influenced by many more factors than just intensity.

a) Noise - how much outside interference exists.

b) Criterion - the level of assurance that you decide must be met before you take action. Involves higher mental processes. You set criterion based on expectations and consequences of inaccuracy.

For example - at a party, you order a pizza...you need to pay attention so that you will be able to detect the appropriate signal (doorbell), especially since there is a lot of noise at the party. But when you first order the pizza, you know it won't be there in 2 minutes, so you don't really pay attention for the doorbell. As the time for the pizza to arrive approaches, however, your criterion changes...you become more focused on the doorbell and less on extraneous noise.

B) ATTENTION

1. Meaning and Definition of Attention

- Attention is the term used or given to the perceptual processes that select certain inputs for inclusion in our conscious experience, or awareness at any given time. It is the process involving the act of listening, and concentrating on a topic, object or event for the attainment of desired ends.
- Attention refers to a wide variety of phenomena, including arousal, alertness, consciousness, and awareness. In general, however, attention is defined as both a process of concentration, such as trying to remember, under-stand, or search for information, and a mental resource that has limited capacity. Attention is selective in that it involves focusing on a certain stimulus to the exclusion of others.
- Attention is the focusing on one thing while ignoring other things that may be going on at the same time. If you are able to continue reading a book without being distracted by children running and screaming around you, and a dog is barking and pulling at your pant leg, then you're maintaining your attention on the book. You have filtered out everything else to focus on one thing. If the dog finally bites your ankle, your attention would shift from the book and may become scattered when you realize the chaos that surrounds you. Attention was first defined in the 1950's by psychologist William James, but is still not completely understood.

- **Attention** is a concept studied in cognitive psychology that refers to how we actively process specific information in our environment. As you are reading this, there are numerous sights, sounds and sensations going on around you – the pressure of your feet against the floor, the sight of the street out of a nearby window, the soft warmth of your shirt, the memory of a conversation you had earlier with a friend.

- **Definition by William James**

One of the first major psychologists, William James, defined attention as follows:

“Everyone knows what attention is. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state.”

2. Nature of Attention

The following are some of the nature of attention:

- Attention is a mental process and not a mental power.
- There can be no attention in the absence of interest.
- The thought of conscious life is impossible in the absence of attention.
- Attention creates readiness for doing a work.
- Attention is a selective process.
- Attention is a part of consciousness, it does not mean consciousness.

3. Characteristics of Attention

The following are some of the characteristics of attention

- Attention is always changing.
- Attention is always an active center of our experience.
- It is selective.
- Attention is continuous.

- Attention increases the clarity of the object.
- It is indivisible.
- The limitation of attention somewhat depends upon relation between the things.

4. Aspects of attention

When it comes to studying or learning, one of the most important ingredients is focus and attention. Attention is the process or act of concentrating on one or more environmental factors that your five senses experience. In case of learning, you'll need to focus or concentrate on the subject matter being thought. But some individuals particularly those suffering from ADHD might have a concern particularly on keeping their focus and attention. This makes the learning process a challenge for them. To learn how to adapt, knowing the four kinds of attention related to cognition is a must. These include: sustained attention, alternating attention, divided attention, and selective attention.

a) Sustained Attention

Sustained attention is the ability to keep that focus or concentration for long periods of time even if the individual is exposed to the repetitive action or activity. This is the kind of attention that is usually used for majority of the learning and working activities like listening to a teacher lecture the whole hour, read books and notes the whole night to review, in answering test or exercise questions, completing an extensive project, or perhaps, regularly working on a repetitive task. This kind of attention should be very beneficial but it is the kind that is oftentimes very hard to acquire or achieve.

b) Selective Attention

Selective attention is the ability to select from the many factors or stimuli and focus to only one that you prefer or your brain selects. This is not really a special and hard to achieve kind of attention. Almost all people use this cognitive ability almost all the time. Every day, people are usually exposed to a number of environmental factors at home, at the school, at the office,

etc but their brains respond by focusing only to the particular factors that matter most or those that people choose to focus on. By better understanding it however, the person is better able to select the appropriate stimuli to devote his or her attention to.

c) Alternating Attention

It is the ability to switch or immediately transfer your focus or concentration from one activity to another. The brain also instantly adapts even if the succeeding activity has a different level of knowledge or comprehension required. Similar to selective attention, alternating attention is also an ability that is used almost all the time. Every day, you need to make sudden changes on your activity or action which also requires your attention to shift.

d) Divided Attention

Divided attention is the ability of an individual to focus or concentrate on two or more environmental factors, stimuli, or activities simultaneously. In its simplest form of explanation, experts call it the ability to multi-task. Multi-tasking is considered a desirable talent for those who are gifted with this ability. But, this means that it will be very difficult for other people to acquire this skill. Divided attention or the ability to multi-task can be learned through practice or gaining expertise in a certain kind of activity.

5. Types of Attention

Depending on the level of cognitive regulation, attention is divided into involuntary, voluntary, and habitual attention.

a) Voluntary Attention

Sometimes an individual will divert his attention towards a particular activity or situation deliberately.

It is not diverted spontaneously, but after some struggle. For example, while sitting in a class, the students divert their attention towards the lecture even if it is not interesting, because they have to pass the examination.

b) Involuntary Attention:

At times the attention is diverted towards some other activity without the conscious effort, may be against the will of the individual.

This is known as involuntary attention. For example, though the student is listening to a lecture with all interest, some loud sound outside the classroom may draw his attention towards it.

c) Habitual Attention:

In some situations, reaction to a stimulus or attending to a stimulus becomes a habit. So the individual will automatically divert his attention towards that stimulus. For example, a musician's attention will automatically be diverted towards the sound of music even if he is busily engaged in talking to somebody.

Attention of a devotee will be diverted towards the temple which he is visiting regularly, the moment he passes through that way.

6. Factors Influencing Attention

There are several factors that can influence attention:

- Objective factors(characteristic of stimuli)
- Intensity of stimulus
- Frequency of repetition
- Size
- Movement
- Change of stimuli
- Novelty
- Subjective (Qualities of the observer)
- Habit or familiarity
- Immediate need

- Profession – interest or motivation
- Innate tendencies

7. Educational Implications

Attention plays a vital role in teaching learning process. Without attention learning cannot be effective. It helps a child to grasp things better. It is a must to learn a skill. Lesson studied with greater attention lasts long. Thus, attention is quite vital to learning.

The following are the educational implications of attention

- The teacher should try to secure attention of the children in teaching-learning situation.
- The teacher should create a conducive environment at the time of teaching in order to concentrate full attention among the children.
- The learning atmosphere should be free from all possible distracting factors.
- In order to create attention the teacher should try to motivate the students at each stage of teaching.
- Diagrams, figures and pictures should be drawn at the time of need.
- Audio-visual aids should be used properly.
- The teacher should move use of gestures, postures, actions and demonstrations at the time of teaching.
- The students should be involved actively in teaching-learning activities.
- Fear of punishment and rude behaviour of teacher should be avoided.
- The teacher should show a fair and impartial treatment to all the students in the class.

The discussed steps will definitely help the students to create attentions among them-selves in the teaching learning situations.