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**FACULTY OF EDUCATION**

**ACADEMIC YEAR 2017-2018**

**LEVEL I**

**MODULE: KNOWLEDGE OF HUMAN BEING I**  
**COMPONENT: GENERAL PSYCHOLOGY**  
**10 CREDITS**

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#### **LEARNING OUTCOMES**

Having successfully completed this component, students should be able to:

Understand and explain the fundamentals of psychology

Understand, explain and differentiate different methods used in Psychology.

Understand and explain key concepts in psychology

#### **ASSESSMENT SCHEDULE**

- Continuous assessment tests will be done during teaching process
- Assignments and class presentation will be done during teaching process
- A final exam will be done according to the timetable established by the Academic secretariat office

## **PART I: FUNDAMENTALS OF PSYCHOLOGY**

### **I.1.A brief history of psychology**

#### ***I.1.1. Origin of Psychology***

The earliest origins of Psychology are found in the ancient civilizations of Greece, Egypt, China, and India.

##### **❖ Psychology has philosophical roots**

The earliest psychologists that we know about are the Greek philosophers who asked many of the same questions that today's psychologists ask. From about 600 to 300 BC, Greek philosophers inquired about a wide range of psychological topics. They were especially interested in the nature of knowledge and how human beings come to know the world, a field of philosophy known as *epistemology*.

The Greek philosopher Socrates and his followers, Plato and Aristotle, wrote about pleasure and pain, knowledge, beauty, desire, free will, motivation, common sense, rationality, memory, and the subjective nature of perception. They also theorized about whether human traits are innate or the product of experience.

In the field of *ethics*, philosophers of the ancient world were interested to a variety of psychological questions: Are people inherently good? How can people attain happiness? What motives or drives do people have? Are human beings naturally social?

##### **❖ Psychology has physiological roots**

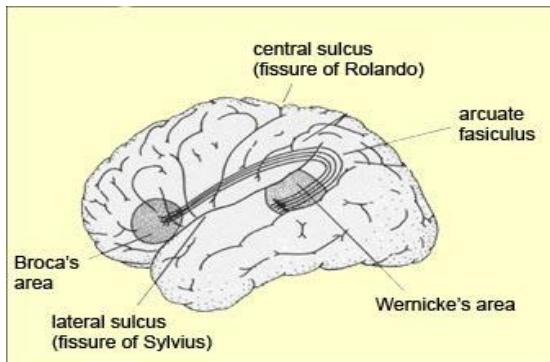
In 19<sup>th</sup> century, physiologists began studying the human brain and nervous systems and their impact on human behavior.

Examples:

***Broca's area , wernicke's area.***

In medicine, physicians were discovering **new links between the brain and language**. The process of identifying the parts of the brain that are involved in language began in 1861. For example French surgeon Paul BROCA discovered that people who suffer damage to a specific part of the brain's hemisphere lose the **ability to produce fluent speech**. This area of the brain became known as ***Broca area***.

In 1874 Carl Wernicke, a German neurologist, discovered another part of the brain (the posterior portion of the left temporal lobe). This one is involved in understanding language. People who had a lesion at this location could speak, but their speech was often **incoherent and made no sense**. This region became known as **Wernicke's area**.



### ***1.1.2. The birth of Psychology as a Science***

The fundamental problem that these philosophers faced was that they had few methods for settling their claims. Most philosophers didn't conduct any research on these questions, in a part because they didn't yet know how to do it, and in another part because they weren't sure if it was even possible to objectively study human experience. But dramatic changes came during the 1800s with the help of the first two research psychologists: the German psychologist Wilhelm Wundt (1832–1920), who developed a psychology laboratory in Leipzig, in Germany in 1879, and the American psychologist William James (1842–1910), who founded a psychology laboratory at Harvard University.

## **1.2. Definitions of psychology**

The meaning of the term psychology has changed over time.

### ***1.2.1 Psychology as the study of the soul***

Etymologically, the psychology is the study of the soul or spirit. This term is derived from the Greek "psykhê" meaning soul or spirit and "logos" meaning "study". Literally it would mean the study of the soul. Until the beginning of 19th century, psychology was still considered as a part of philosophy that seeks to explore the human soul. The definition of psychology as a study of the soul raises a problem because the soul, metaphysical reality, is not accessible. Moreover, the soul is an abstract concept that even the methods of the most modern scientific investigation are inappropriate to explore.

### ***1.2.2. Psychology as the study of consciousness***

Psychology has also been defined as the description and explanation of states of consciousness. That was the conception of some American philosophers like William James (1842-1916). In classical philosophy, the individual can know himself or he is “transparent to himself”. For example Socrates said: "Know you." Descartes said "Cogito-Ergosum" (I think therefore I am)

A number of psychologists voiced criticism because,

- We are not totally conscious of our acts. Freud emphasis on unconscious motives which lead some of our acts.
- The conscious experience cannot be submitted to scientific experiment. Only the individual who has this experience can describe it. Another could not trace it in the same conditions.

### ***1.2.3. Psychology as the study of observable behavior***

American psychologist John B. Watson believed that psychology should be a study of observable behavior instead of speculating about a person’s inner thoughts and feelings. Watson’s approach, which he termed behaviorism, dominated psychology for the first half of the 20th century. Although this definition of Watson attempts to consider human as being too mechanistic , it has contributed greatly to the development of objective psychology. Most psychologists define psychology as the study of human and animal behavior.

### ***1.2.4. Current definition of psychology***

Psychologists have been also interested on mental processes not directly observable such as thoughts, dreams, desires, memories (as opposed to psychological processes directly observable such as gestures) and for that reason the complete definition of Psychology is the scientific study of observable behavior and mental life or mental processes.

The definition contains three elements. The first is that psychology is a *scientific* study that obtains knowledge through systematic and objective methods of observation and experimentation. Second is that psychologists study *behavior*, which refers to any *action or*

*reaction* that can be measured or observed, such as the blink of an eye, an increase in heart rate, etc. Third is that psychologists study the *mind*, which refers to both conscious and unconscious mental states. These states cannot actually be seen, only inferred from observable behavior.

### **I.3. Goals of Psychology**

The study of psychology has five important goals:

- 1. Describe:** The first goal is to observe behavior and describe, often in minute detail, what was observed as objectively as possible
- 2. Explain:** While descriptions come from observable data, psychologists must go beyond what is obvious and explain their observations. In other words, why did the subject do what he or she did?
- 3. Predict:** Once we know what happens, and why it happens, we can begin to speculate what will happen in the future because as we say, "the best predictor of future behavior is past behavior."
- 4. Control:** Once we know what happens, why it happens and what is likely to happen in the future, we can control it.
- 5. Improve:** Not only do psychologists attempt to control behavior; they want to do so in a positive manner, they want to improve a person's life, not make it worse.

### **I.4. Psychology and other sciences**

Psychology is connected with *Philosophy*, because, as we said, the history of psychological thought begins in philosophy, we have given quite explanations in the previous pages. Other relationship between two sciences is that, both are interested in human nature. They differ from the methods used. Philosophy uses reflexion as his main method, whereas Psychology uses scientific methods.

Psychology overlaps with other sciences that investigate behavior and mental processes. Certain parts of the field share much with the *biological sciences*, especially physiology, the biological study of the functions of living organisms and their parts. Like physiologists, many psychologists study the body from a biological perspective. However, psychologists usually focus on the activity of the brain and nervous system.



The *social sciences* of sociology and anthropology, which study human societies and cultures, also intersect with psychology. For example, both psychology and sociology explore how people behave when they are in groups. However, psychologists try to understand behavior from the vantage point of the individual, whereas sociologists focus on how behavior is shaped by social forces and social institutions. Anthropologists investigate behavior as well, paying particular attention to the similarities and differences between human cultures around the world.

Psychology is closely connected with *psychiatry*, which is the branch of medicine specializing in mental illnesses. The study of mental illness is one of the largest areas of research in psychology. Psychiatrists and psychologists differ in their training. A person seeking to become a psychiatrist first obtains a medical degree and then engages in further formal medical education in psychiatry. Most psychologists have a doctoral graduate degree in psychology.

### **I.5. Major areas of research in Psychology**

The study of psychology draws on two kinds of research: basic and applied.

#### ***I.5.1 Basic research:***

*Research psychologists or Basic Psychologists* seek to test general theories and build a foundation of knowledge about the causes of behavior. There are five major areas of basic research: It means that basic psychologists are interested in developing theories and principles in different branches of Psychology such as biopsychology, clinical psychology, cognitive psychology, developmental psychology, and social psychology.

#### **❖ Biopsychology**

The branch of psychology which focuses on the study of how the brain influences behavior is often known as biopsychology, **physiological psychology**, or **psychobiology**.

#### **❖ Clinical psychology**

Clinical psychology is dedicated to the study, diagnosis, and treatment of mental illnesses and other emotional or behavioral disorders

#### **❖ Cognitive psychology**

Cognitive psychology is the branch of psychology that focuses on **internal states( mental processes)**, such as motivation, problem solving, decision-making, thinking and attention.

#### ❖ **Developmental psychology**

This branch of psychology looks at development throughout the lifespan, from childhood to adulthood. The scientific study of human development seeks to understand and explain how and why people change throughout life. This includes all aspects of human growth, including physical, emotional, intellectual, social, and perceptual and personality development. Topics studied in this field include everything from prenatal development to old age.

#### ❖ **Social psychology**

*Social psychology* is the scientific study of how people think, feel, and behave in social situations. Researchers in this field ask questions such as, how do we form impressions of others? How are people persuaded to change their attitudes or beliefs? What causes people to conform in group situations? What leads someone to help or ignore a person in need? Under what circumstances do people obey or resist orders?

#### ***1.5.2 Applied research: Practical application of Psychology***

Whereas Research Psychologists test theories about mind and behavior, **applied psychologists or psychologist-practitioners** use existing research to enhance the people's everyday life. It means that they are motivated by a desire to solve practical human problems. Some examples of domains in which Psychology is applied :

#### ❖ **Health**

Today, many psychologists work in area of health psychology, the application of psychology to the promotion of physical health and the prevention and treatment of illness. Researchers in this area have shown that **human health and well-being depends on both biological and psychological factors.**

Many psychologists in this area study psychophysiological disorders (also called *psychosomatic disorders*), they are physiological or physical disorders which are influenced

by psychological states, most often stress. These disorders include high blood pressure, headaches, asthma, and ulcers.

Health psychologists have found that people who have family, friends, and other forms of social support are healthier and live longer than those who are more isolated.

Other researchers in this field examine the psychological factors that underlie smoking, drinking, drug abuse, risky sexual practices, and other behaviors harmful to health.

### ❖ **Education**

There are two fields within psychology which focus exclusively on education: educational psychology and school psychology.

*Educational psychologists* seek to understand and improve the teaching and learning process within the classroom and other educational settings. Educational psychologists study topics such as intelligence, student motivation, discipline and classroom management, curriculum plans, etc. They also test general theories about how students learn most effectively.

*School psychologists* work in elementary and secondary school systems administering tests, making recommendations, and counseling children with academic or emotional problems.

### ❖ **Business**

In the business world, psychology is applied in the workplace and in the marketplace. Industrial-organizational psychology focuses on human behavior in the workplace and other organizations. Industrial-organizational psychologists conduct research, teach in business schools or universities, and work in private industry. Many Industrial-organizational psychologists study the factors that influence worker motivation, satisfaction, and productivity.

### ❖ **Law**

Many psychologists today work in the legal system. They testify in court as expert witnesses, counsel prisoners, teach in law schools, and research various justice-related issues.

Forensic psychologists( those who apply psychology to the law) study a range of issues, including jury selection, eyewitness testimony, , lie-detector tests, the death penalty, etc

### ❖ **Environmental psychologists**

They focus on the relationship between people and their physical surroundings. They study how street noise, architectural design, population density, affects people's behavior and mental health.

#### ❖ **Sports psychologists**

They advise athletes and study the physiological, motivational, developmental, and social aspects of athletic performance.

Psychology can be applied in many other domains of human life.

### **I.6.Methods in Psychology**

Over the years, psychologists have devised numerous ways to test their hypotheses and theories. Many studies are conducted in a laboratory, usually located at a university. The laboratory setting allows researchers to control what happens to their subjects and make careful and precise observations of behavior. For example, a psychologist who studies memory can bring volunteers into the lab, ask them to memorize a list of words or pictures, and then test their recall of that material seconds, minutes, or days later. Studies may also be conducted in real-world locations. In both laboratory and field settings, psychologists conduct their research using a variety of methods

#### ***1.61.Introspection***

Introspection is a method of self-observation. The word 'Introspection' is made up of two Latin words. "Intro" meaning within and "Aspection" meaning looking. Hence it is a method where an individual is looking within one self. Introspection method is one of the oldest methods to collect data about the conscious experiences of the subject. It is a process of self – examination where one perceives, analyses and reports one's own feelings. Let us learn this process with the help of an example, suppose you are happy and in the state of happiness you look within yourself. It is said you are introspecting your own mental feelings and examining what is going on in your mental process in the state of happiness. Similarly, you may introspect in state of anger or fear; etc. Introspection is also defined as the notice, which the mind takes of itself.

#### ***1.6.2 Case histories***

Sometimes psychologists obtain information about human life or behavior by referring to a case history, which is a particular biography of a particular individual. This involves asking people to recall relevant experiences from their past. For example, if the research is concerned with the childhood antecedents of adult depression, the researcher might begin by asking questions about early life events. These case histories are biographies designed for scientific use, and they are important sources of data for psychologists who are studying individuals.

### ***1.6.3. Observation***

Observe: It is to find facts by the senses. It is inseparable from the interview. It consists, for example by noting facial expressions, gestures, intonations, pauses, ... As it can be seen, the observation may be done occasionally (*occasional observation*) and without prior assumptions or otherwise we can have an explicit hypotheses and reliable means to properly carry out the observation (*systematic observation*). In the process of observation, four steps are generally required:

With regard to systematic observation, some techniques are used.

#### **a) The direct and discreet observation**

It is to observe without having relationships with what is being observed in order to eliminate interference problems (changes of behavior).

#### **b) Direct and Passive observation**

It requires an authentic acceptance of observer by observed groups and subgroups: The observer becomes familiar with the group and the members are also familiar to him. That is very important because when the observer is not rejected by the observed group he will observe easily.

**c) The observation assisted by instruments:** the recording instruments are needed to supplement human observation

### ***1.6.4. Measures of brain activities***

Biopsychologists interested in the links between brain and behavior use a variety of specialized techniques in their research.

One approach is to **observe and test patients** who have suffered damage to a specific region of the brain to determine what mental functions and behaviors were affected by that damage.

A second approach is to **physically alter the brain** and measure the effects of that change on behavior. The alteration can be achieved in different ways. For example, animal researchers often damage or destroy a specific region of an animal's brain through surgery. Other researchers might spark or inhibit activity in the brain through the use of drugs or electrical stimulation.

Another way to study the relationship between the brain and behavior is **to record the activity of the brain with machines** while a subject engages in certain behaviors or activities. One such instrument is the *electroencephalograph*, a device that can detect, amplify, and record the level of electrical activity in the brain by means of metal electrodes taped to the scalp.

### ***1.6.5 Archival studies and literature review***

One way to learn about people is through *archival studies*, an examination of **existing records of human activities**. Psychological researchers often examine old newspaper stories, medical records, birth certificates, crime reports, popular books, and artwork. They may also examine statistical trends of the past, such as crime rates, birth rates, marriage and divorce rates, and employment rates. The strength of such measures is that by observing people only secondhand, researchers cannot unwittingly influence the subjects by their presence. However, available records of human activity are not always complete or detailed enough to be useful.

### ***1.6.6 Surveys***

In contrast with the in-depth study of one person, *surveys* describe a specific population or group of people. Surveys involve asking people a series of questions about people behaviors, thoughts, or opinions. Surveys can be conducted in person, over the phone, or through the mail. Most surveys study a specific group; for example, college students, working mothers, men, or homeowners. Rather than questioning every person in the group, survey researchers choose a **representative** sample of people and **generalize** the findings to the larger population. Surveys may pertain almost any topic. Often surveys ask people to report their feelings about various social, political, cultural issues, etc.

Surveys must be carefully designed and conducted to ensure their accuracy. The results can be influenced, and biased, by two factors: **who the respondents are** and **how the questions are asked**. For a survey to be accurate, the sample being questioned must be representative of

the population on key characteristics such as sex, race, age, region, and cultural background. To ensure similarity to the larger population, survey researchers usually try to make sure that they have a *random sample*, a method of selection in which everyone in the population has an equal chance of being chosen.

### ***1.6.7 Experimental Methods***

In an experiment, the psychologist manipulates one factor in a situation (keeping other aspects of the situation constant) and then observes the effect of the manipulation on behavior. The people whose behavior is being observed are the **subjects** of the experiment. The factor that an experimenter varies (the proposed cause) is known as the ***independent variable***, and the behavior being measured (the result of experiment) is called the ***dependent variable***. In a test of the hypothesis that individuals will perform better in mathematics if they are offered money for a good performance, the money offered would be the independent variable, good performance in mathematics is the dependent variable.

In its most basic form, a typical experiment compares a large number of subjects who are randomly assigned to experience one condition with a group of similar subjects who are not. Those who experience the condition compose ***the experimental group***, and those who do not, make up the **control group**.

## **PART 2: PSYCHOLOGICAL KEY CONCEPTS**

### **CHAPTER I: SENSATION AND PERCEPTION**

#### **I.1. Introduction**

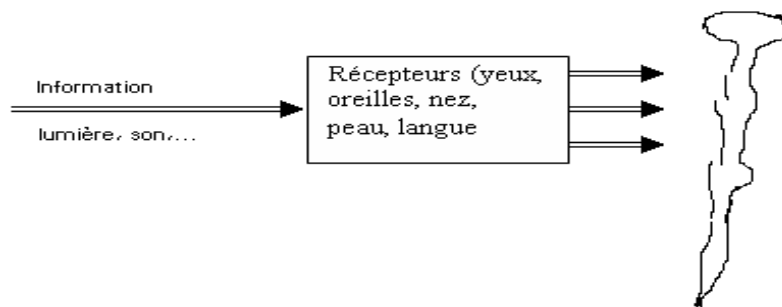
- ❖ **Sensation** usually refers to the immediate, relatively unprocessed result of stimulation of sensory receptors in the eyes, ears, nose, tongue, or skin.
- ❖ **Perception** is the process by which organisms interpret and organize sensation to produce a meaningful experience of the world. In practice, sensation and perception are virtually impossible to separate, because they are part of one continuous process.

Our sense organs translate physical energy from the environment into electrical impulses processed by the brain. For example, light, in the form of electromagnetic radiation, causes receptor cells in our eyes to activate and send signals to the brain. But we do not understand

these signals as pure energy. The process of perception allows us to interpret them as objects, events, people, and situations.

Without the ability to organize and interpret sensations, life would seem like a meaningless jumble of colors, shapes, and sounds. A person without any perceptual ability would not be able to recognize faces, understand language, or avoid threats. Such a person would not survive for long. In fact, many species of animals have evolved exquisite sensory and perceptual systems that aid their survival.

Organizing raw sensory stimuli into meaningful experiences involves cognition, a set of mental activities that includes thinking, knowing, and remembering. **Knowledge and experience** are extremely important for perception, because they help us make sense of the input to our sensory systems



### ❖ Sensory Adaptation

The last concept refers to stimuli which has become redundant or remains unchanged for an extended period of time. Have you ever wondered why we notice certain smells or sounds right away and then after a while they fade into the background? Once we adapt to the perfume or the ticking of the clock, we stop recognizing it. This process of becoming less sensitive to unchanging stimulus is referred to as sensory adaptation, after all, if it doesn't change, why do we need to constantly sense it?

## 1.2. Factors of perception

Why does the brain decide to pay attention to certain stimuli rather than others? This question led us to the factors of perception. There are two groups of factors that determine how the subject will pay attention in perception.



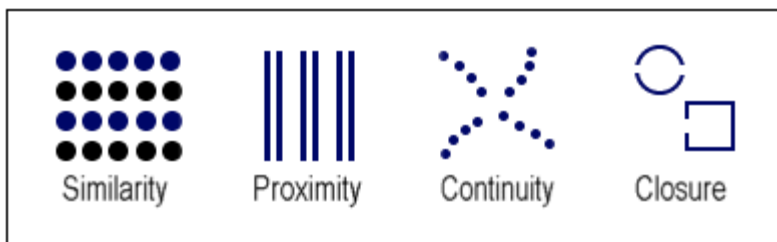
- internal factors
- external factors
- experience and context

### 1.2.1. Internal factors

- ❖ **Physiological factors:** to feel and perceive, the brain must be in good condition, that means there must be, in the brain specialized cells which respond only to a certain type of sensory information.
- ❖ **Psychological factors:** Motivation and personal needs greatly influence the selection of information. Moreover, personality and interests also influence the perception.  
Example: a footballer will be interested to football game while a musician will listen carefully to the famous musician.

### 1.2.2. External factors

Those are factors related to the stimulus: it means here environmental influences. When we are dealing with a wide variety of stimuli, we automatically select those which are intense, new, moving, contrasting, repetitive or grouped



#### ❖ Similarity

The law of similarity leads us to link together parts of the visual field that are similar in color, lightness, texture, shape, or any other quality. That is why, in the following illustration, we perceive rows of objects instead of columns or other arrangements.

#### ❖ Proximity

In the next figure, we tend to perceive three columns of two lines each rather than six different lines. The lines are grouped together because of how closed they are to each other, or their proximity to one another.

### ❖ **Continuity**

Continuity refers to our tendency to see patterns and therefore perceive things as belonging together if they form some type of continuous pattern. In the third figure, although merely a series of dots, it begins to look like an "X".

### ❖ **Closure**

According to the law of closure, we prefer complete forms to incomplete forms. In the figure, we demonstrate closure, or our tendency to complete familiar objects that have gaps in them. Even at first glance, we perceive a circle and a square.

### ❖ **Common fate**

The law of common fate leads us to group together objects that move in the same direction. Because of this principle, we often see flocks of birds or schools of fish as one unit.

### ❖ **Figure and ground relationship**



Not only does perception involve organization and grouping, it also involves distinguishing an object from its surroundings. Notice that once you perceive an object, the area around that object becomes the background. For example, when you look at your computer monitor, the wall behind it becomes the background. The object, or *figure*, is closer to you, and the background, or *ground*, is farther away.

Gestalt psychologists have devised ambiguous figure-ground relationships, that are a drawing in which the figure and ground can be reversed. Consider the accompanying

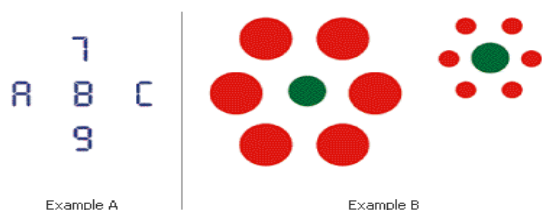
illustration entitled “Figure and Ground.” You may see a white vase as the figure, in which case you will see it displayed on a dark ground. However, you may also see two dark faces that point toward one another. Notice that when you do so, the white area of the figure becomes the ground; in other words your perception may alternate between these two possible interpretations. **Notice also that when the white area is smaller, the vase is more likely to be seen and when the white area is bigger, the faces are more likely to be seen**

### *1.2.3.Experience*

Philosophers have long debated the role of experience in human perception. In the late 17th century, Irish philosopher William Molyneux wrote to his friend, English philosopher John Locke, and asked him to consider the following scenario: Suppose that you could restore sight to a person who was blind. Using only vision, would that person be able to tell the difference between a cube and a sphere, which she or he had previously experienced only through touch? Locke, who emphasized the role of experience in perception, thought the answer was no.

Other researchers, British psychologist Richard Gregory and British-born neurologist Oliver Sacks have written about their experiences with men who were blind for a long time due to cataracts and then had their vision restored late in life. When their vision was restored, they were often confused by visual input and were unable to see the world accurately. For instance, they could detect motion and perceive colors, but they had great difficulty with complex stimuli, such as faces. Much of their poor perceptual ability was probably due to the fact that the synapses in the visual areas of their brains had received little or no stimulation throughout their lives. Thus, **without visual experience, the visual system does not develop properly.**

### *1.2.4.The context*



Visual experience is useful because it creates memories of past stimuli that can later serve as a context for perceiving new stimuli. Thus, you can think of experience as a form of context that you carry around with you.

Ordinarily, when you read, you use the context of your prior experience with words to process the words you are reading. Context may also occur outside of you, as in the surrounding elements in a visual scene. When you are reading and you encounter an unusual word, you may be able to determine the meaning of the word by its context. Similarly, when looking at the world, you routinely make use of context to interpret stimuli. For instance, look at Example A in the illustration called “Context Effects.” Note that you can perceive an identical stimulus as either a *B* or an 8, depending on whether you read the row of letters or the column of numbers. Your perception depends on the context.

Although context is useful most of the time, on some rare occasions, context can lead you to misperceive a stimulus. Look at Example B in the “Context Effects” illustration. Which of the green circles is larger? You may have guessed that the green circle on the right is larger. In fact, the two circles are the same size. Your perceptual system was fooled by the context of the surrounding red circles.

### **1.3. Unusual perceptual experiences**

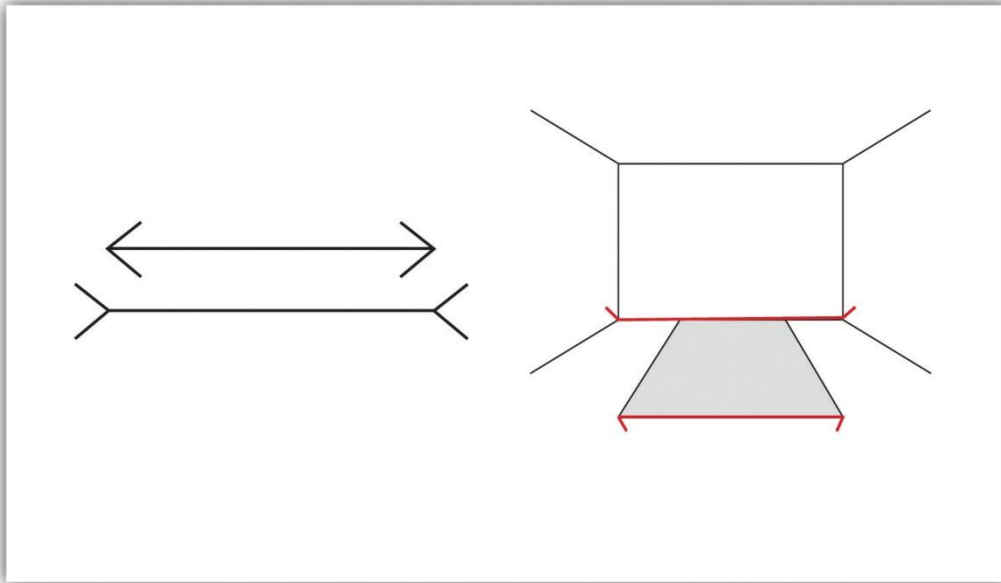
#### ***1.4.1. Illusions***

An **illusion** is a distortion of the senses, revealing how the brain normally organizes and interprets sensory stimulation. While illusions distort reality, they are generally shared by most people. Illusions may occur with more of the human senses than vision, but visual illusions, are the most well known and understood. The emphasis on visual illusions occurs because vision often dominates the other senses.

The type of illusion which has been more studied is the **optical illusion** (also called a **visual illusion**) is characterized by visually perceived images that differ from objective reality. The information gathered by the eye is processed in the brain to give a perception that does not match with a physical measurement of the stimulus source.

Examples:

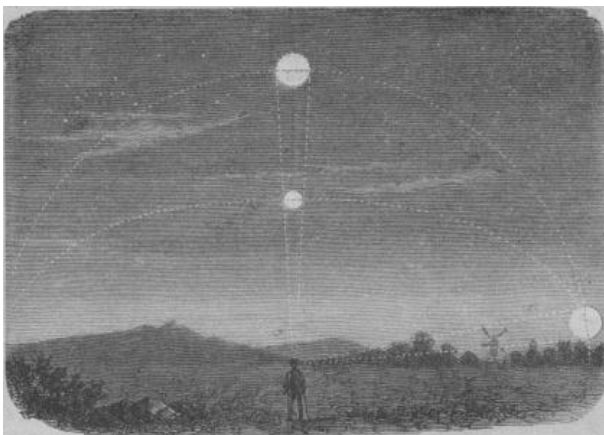
#### ***1) Muller-Lyer Illusion***



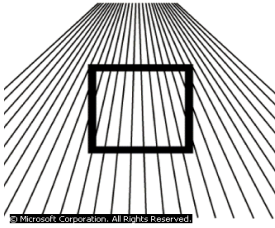
Which of the two vertical line segments is longer? Although your visual system tells you that the left one is longer, a ruler would confirm that they are equal in length. The Muller-Lyer illusion is one of the most famous of illusions. For the second figure, the line segment in the bottom arrow looks longer to us than the one on the top, even though they are both actually the same length

## 2) *Moon illusion (Robert Smith, 1767)*

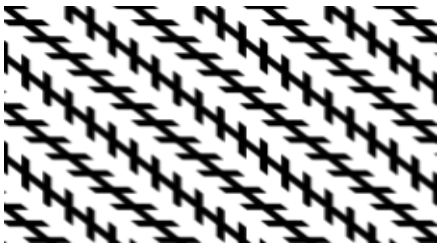
The *moon illusion* refers to the fact that the moon is perceived to be about 50% larger when it is near the horizon than when it is seen overhead, despite the fact that both moons are the same size



### 3) *Zöllner Illusion*



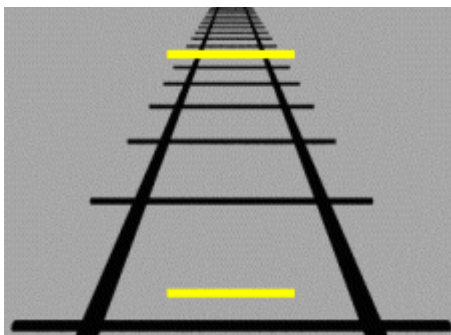
This perfect square appears trapezoidal, that is, wider at the top than at the bottom. This illusion may occur because the lines create a sense of depth, making the top of the square seem farther away and larger.



In this figure the black lines seem to be unparallel, but in reality they are parallel. The shorter lines are on an angle to the longer lines. This angle helps to create the impression that one end of the longer lines is nearer to the viewer than the other end.

### 4) *The Ponzio Illusion*

The top yellow bar seems longer than the bottom one, but if you measure them you'll see that they are exactly the same length



### 1.4.2 *Hallucinations*

Hallucinations are defined as “an apparent perception of an external object when no such object is there”. Hallucinations are generated by the mind rather than by any external stimuli, and may be seen, heard, felt, and even smelled or tasted by the victim.

### ❖ **Types of hallucinations**

Hallucinations are categorized according to which sensory modality is involved.

**Auditory hallucinations**: The false perception of sound, music, noises, or voices. Hearing voices when there is no auditory stimulus is the most common type of auditory hallucination in mental disorders. The voice may be heard either inside or outside one's head and is generally considered more severe when coming from outside one's head. The voices may be male or female, recognized as the voice of someone familiar or not recognized as familiar, and may be critical or positive

**Gustatory hallucinations** : A false perception of taste. Usually, the experience is unpleasant. For instance, an individual may complain of a persistent taste of metal. This type of hallucination is more commonly seen in some medical disorders (such as epilepsy) than in mental disorders.

**Olfactory hallucinations**: A false perception of odor or smell. Typically, the experience is very unpleasant. For example, the person may smell decaying fish, dead bodies, or burning rubber. Sometimes, those experiencing olfactory hallucinations believe the odor emanates from them..

**Somatic/tactile hallucinations**: A false perception or sensation of touch or something happening on the body. Example: feeling electricity through one's body and feeling like someone is touching one's body but no one is there.

**Visual hallucinations**: A false perception of sight. The content of the hallucination may be anything (such as shapes, colors, and flashes of light) but are typically people or human-like figures. For example, one may perceive a person standing before him when no one is there

### ❖ **Some causes of hallucinations:**

Hallucinations can appear during psychological events like stress, hypertension or frustration; fatigue, melancholy, sleep deprivation for a longer period.

### **Meditation and/or sensory deprivation:**

When the brain lacks external stimulation to form perceptions, it may compensate by referencing the memory and form hallucinatory perceptions. This condition is commonly found in blind and deaf individuals.

### **Brain damage or disease**

Lesions or injuries to the brain may alter brain function and produce hallucinations. Apart from Medico-Surgical conditions can produce hallucinations.

### **Drugs:**

Use of Psychotomimetics and many medication's side-effects could trigger hallucinations: Hallucinogenics such as ecstasy, LSD, mescaline (3, 4, 5-trimethoxyphenethylamine, or peyote), and psilocybin trigger hallucinations. Other drugs such as marijuana and PCP have hallucinatory effects. Certain prescription medications may also cause hallucinations.

Occasionally, people who are in good mental health could experience a hallucination. If hallucinations are infrequent and transitory, and can be accounted for by short-term (environmental factors such as sleep deprivation or meditation), no treatment may be necessary. However, if hallucinations are hampering an individual's ability to function, a general physician, psychologist, or psychiatrist should be consulted to pinpoint their source and recommend a treatment plan. Hallucinations that are symptomatic of a mental illness such as schizophrenia should be treated by a psychologist or psychiatrist.

## **CHAPTER II: MEMORY**

### **II.1 Introduction**

Memory is important to humans and all other living organisms. Practically all of our daily activities: talking, understanding, reading, socializing, etc, depend on our having learned and stored information about our environments. Memory allows us to retrieve events from the distant past or from moments ago. It enables us to learn new skills and to form habits.

Without the ability to access past experiences or information, we would be unable to



comprehend language, recognize our friends and family members, find our way home, or even tie a shoe. Life would be a series of disconnected experiences, each one new and unfamiliar. Without any sort of memory, humans would quickly perish.

Memory and learning are closely related. The term learning, as we shall see later is often used to refer to processes involved in the initial acquisition or encoding of information, whereas the term memory more often refers to later storage and retrieval of information. However, this distinction is not hard and fast. After all, information is learned only when it can be retrieved later, and retrieval cannot occur unless information was learned. Thus, psychologists often refer to the learning/memory process as a means of incorporating all facets of encoding, storage, and retrieval.

Psychologists conceptualize memory in terms of *types*, in terms of *stages*, and in terms of *processes*. In this chapter we will consider the two types of memory, *explicit memory* and *implicit memory*, and then the three major memory stages: *sensory*, *short-term*, and *long-term memory*. We will consider also the nature of long-term memory, with a particular emphasis on the cognitive techniques we can use to improve our memories. Our discussion will focus on the three processes that are central to long-term memory: *encoding*, *storage*, and *retrieval*

**Memory Conceptualized in Terms of Types, Stages, and Processes.**

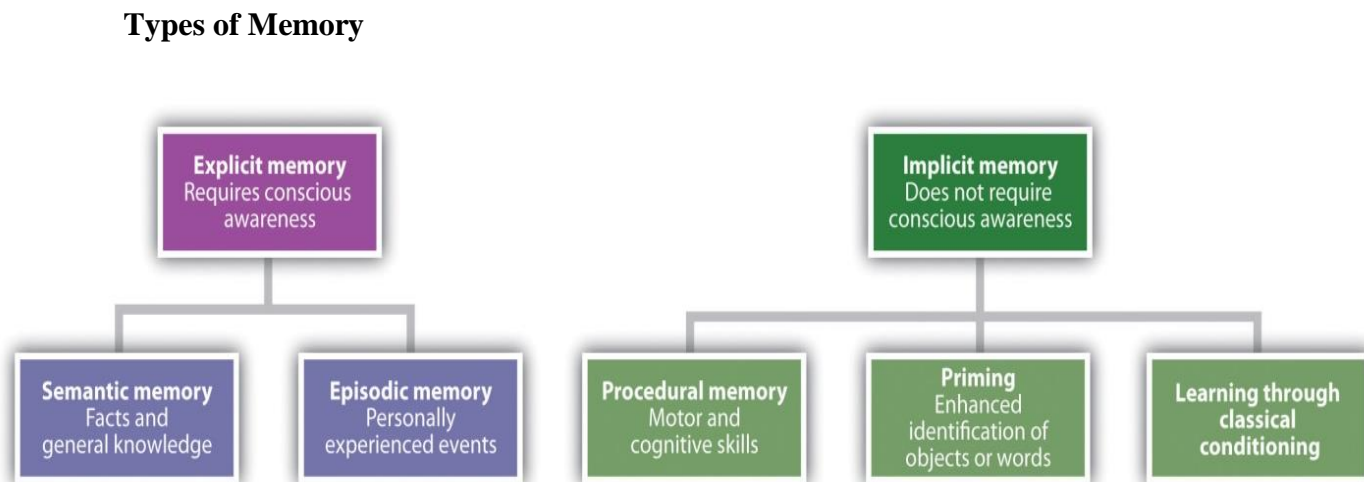
<b>As types</b>	Explicit memory Implicit memory
<b>As stages</b>	Sensory memory Short-term memory Long-term memory
<b>As processes</b>	Encoding Storage Retrieval

**II.2. Types of memory: Explicit and Implicit Memory**

Although the English language uses a single word for memory, there are actually different kinds. Psychologists distinguish two main types: explicit memory and implicit memory.

## II.2.1 Explicit Memory

When we assess memory by asking a person to consciously remember things, we are measuring *explicit memory*. Explicit memory refers to **knowledge or experiences that can be consciously remembered**. In other words, it refers to the **deliberate, conscious recollection of facts and past experiences**. As you can see in Figure below “Types of Memory”, there are two types of explicit memory: *episodic memory* and *semantic memory*.



### a) *Episodic memory*

Episodic memory refers to memories of specific episodes in one’s life and is what most people think of as memory. Episodic memories are connected with a specific time and place. If you were asked to recount everything you did yesterday, you would rely on episodic memory to recall the events. Similarly, you would draw on episodic memory to describe a family vacation, the way you felt when you won an award, or the circumstances of a childhood accident. Episodic memory contains the personal, autobiographical details of our lives.

### b) *Semantic memory*

Semantic memory refers to our general knowledge of the world and all of the facts we know. Semantic memory allows a person to know that the chemical symbol for salt is NaCl, that dogs have four legs, that Egypt has pyramids, that  $3 \times 3$  equals 9, and other facts. Semantic memories are not tied to the particular time and place of learning. For example, in order to

remember that Egypt has pyramids, people do not have to recall the time and place that they first learned this fact.

## II.2.2 Implicit Memory

While explicit memory consists of the things that we can consciously report that we know, implicit memory refers to using stored information without making effort to retrieve (remember) it. People often retain and use prior experiences without realizing it. As you can see in Figure “Types of Memory”, there are three general types of implicit memory: procedural memory, classical conditioning effects, and priming.

### a) Procedural memory

Procedural memory refers to the skills that humans possess. *These skills are often unexplainable knowledge of how to do things*. Procedural memory allows us to perform complex tasks, even though we may not be able to explain to others how we do them. There is no way for example to tell someone how to ride a bicycle; a person has to learn by doing it. Tying shoelaces, riding a bicycle, driving a car, swimming, are examples of procedural memory.

### b) Classical conditioning effect

A second type of implicit memory is classical conditioning effects, in which we learn, often without effort or awareness, to associate neutral stimuli (such as a sound or a light) with another stimulus (such as food), which creates a naturally occurring response, such as enjoyment or salivation. The memory for the association is demonstrated when the conditioned stimulus (the sound) begins to create the same response as the unconditioned stimulus (the food) did before the learning.

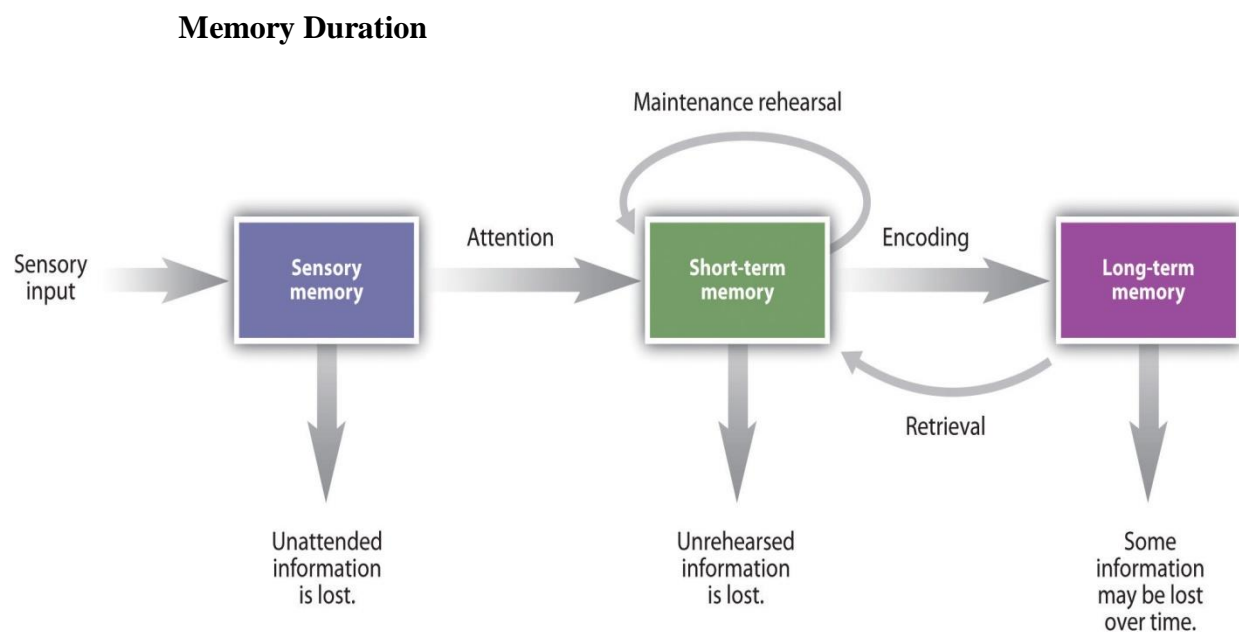
### c) Priming

The final type of implicit memory is known as priming, or **changes in behavior as a result of experiences that have happened frequently or recently**. Priming refers both to the activation of knowledge (e.g., we can prime the concept of kindness by presenting people with words related to kindness and to the influence of that activation on behavior (people who are primed with the concept of kindness may act more kindly). Our everyday behaviors

are influenced by priming in a wide variety of situations. Seeing an advertisement for cigarettes may make someone start smoking, seeing the flag of our country may arouse our patriotism, and seeing a student from a rival school may arouse our competitive spirit. And these influences on our behaviors may occur without our being aware of them.

### II.3 Stages of Memory: Sensory, Short-Term, and Long-Term Memory

Another way of understanding memory is to think about it in terms of stages that describe the length of time that information remains available to us. According to this approach (see the figure “Memory Duration”), information begins in *sensory memory*, moves to *short-term memory*, and eventually moves to *long-term memory*. But not all information makes it through all three stages; most of it is forgotten. Whether the information moves from shorter-duration memory into longer-duration memory or whether it is lost from memory entirely depends on how the information is attended to and processed.



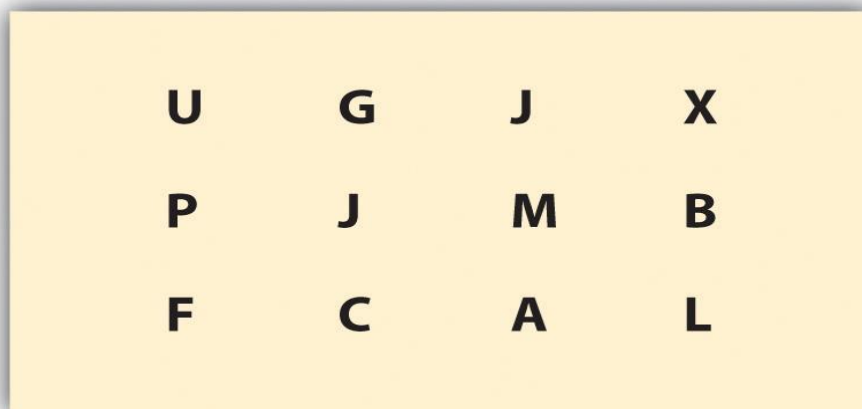
We notice from this illustration that information that enters the brain is briefly recorded in sensory memory. If we focus our attention on it, the information may become part of working memory (also called short-term memory), where it can be manipulated and used. Through encoding techniques such as repetition and rehearsal, information may be transferred to long-term memory. Retrieving long-term memories makes them active again in working memory.

#### II.3.1 Sensory memory

Sensory memory refers to the information we receive through the senses. It refers to **the brief storage of sensory information**. This memory is very brief lasting only as much as a few seconds.

We talk about *iconic memory* when information is being interpreted by the visual system; whereas *Echoic memory* is the name applied to the same phenomenon in the auditory domain: the brief mental echo that persists after information has been heard. Similar systems are assumed to exist for other sensory systems (touch, taste, and smell), although researchers have studied these senses less carefully.

American psychologist George Sperling demonstrated the existence of sensory memory in an experiment in 1960. Sperling asked subjects in the experiment to look at a blank screen. Then he flashed an array of 12 letters on the screen for one-twentieth of a second, arranged in the following pattern:



Subjects were then asked to recall as many letters from the image as they could. Subjects knew they had seen more letters, but they were unable to name them.

Sensory memory systems typically function outside of awareness and store information for only a very short time. *Iconic* memory seems to last less than a second. *Echoic* memory probably lasts a bit longer; estimates range up to three or four seconds. Usually sensory information coming in next, replaces the old information. For example, when we move our eyes, new visual input masks or erases the first image. The information in sensory memory vanishes unless it captures our attention and enters working memory.

### ***II.3.2. Short-Term or Working Memory (STM)***

Psychologists originally used the term *short-term memory* to refer to the ability to hold information in mind over a brief period of time. As conceptions of short-term memory expanded to include more than just the brief storage of information, psychologists created new terminology. The term *working memory* is now commonly used to refer to a broader system that both stores information briefly and allows manipulation and use of the stored information.

We can keep information circulating in working memory by rehearsing it. For example, suppose you look up a telephone number in a directory. You can hold the number in memory almost indefinitely by saying it over and over to yourself. But if something distracts you for a moment, you may quickly lose it and have to look it up again. Forgetting can occur rapidly from working memory.

#### ***Serial Position : primacy, and recency effect***

Psychologists often study working memory storage by examining how well people remember a list of items. In a 1966 experiment, subjects were shown a series of 15 words, then tested for their recall of the words immediately or after 30 seconds. When tested immediately, people remembered items at the beginning and end of the series better than those in the middle, a phenomenon called the serial position effect, because the chance of recalling an item is related to its position in the series.

Subjects in both conditions demonstrated what is known as the primacy effect, which is better recall of the first few list items. Psychologists believe this effect occurs because people tend to process the first few items more than later items. Subjects in the immediate-recall condition also showed the recency effect or better recall of the last items on the list. The recency effect occurs because people can store recently presented information temporarily in working memory. When the recall test is delayed for 30 seconds, however, the information in working memory fades, and the recency effect disappears.

### ***II .3.3.Long-Term Memory (LTM)***

Information may pass from short term-memory to long-term memory (LTM). Long Term Memory is *memory storage that can hold information for days, months, and years*. The capacity of long-term memory is large, and there is no known limit to what we can remember. Although we may forget at least some information after we learn it, other things will stay with us forever.

## II.4 Processes of memory

Human memory, like memory in a computer, allows us to store information for later use. In order to do this, however, we need to master three processes involved in memory. The first is called encoding which is the process we use to transform information so that it can be stored.

### Example:

Twelve items of information:

O C N S S A O N T U A S N

The same information, grouped into four meaningful units (chunks):

CNN USA NATO SOS

---

Five items of information:

Huron Ontario Michigan Erie Superior

One meaningful chunk, created from the first letter of each word:

HOMES

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The next process is called **storage**. This is the retention of encoded information over time. The final process called **retrieval** refers to the processes involved in using stored information. Whenever people successfully recall a prior experience, they must have encoded, stored, and retrieved information about the experience. Conversely, memory failure, for example, forgetting an important fact, reflects a breakdown in one of these stages of memory.

## II.5 Some factors of memory and forgetting

### II.5.1 Age

People's age affects the rate of learning and ability to recall past events and experiences. For instance, children and old people are quick or prompt to remember less their past experiences as compared to teenagers and adults. The reason may be due to less developed brains and degeneration of brain cells respectively.

### ***II.5.2 Intelligence***

Working memory capacity is correlated with intelligence (as measured by intelligence tests). This correlation has led some psychologists to argue that working memory abilities are essentially those that underlie general intelligence. **The more capacity people have to hold information in mind while they think, the more intelligent they are.**

### ***II.5.3.Repression***

Another possible cause of forgetting resides in the concept of *repression*, which refers to forgetting an unpleasant event or piece of information due to its threatening quality. The idea of repression was introduced in the late 19th century by Austrian physician Sigmund Freud, the founder of psychoanalysis. According to Freudian theory, people banish unpleasant events into their unconscious mind. However, repressed memories may continue to unconsciously influence people's attitudes and behaviors and may result in unpleasant side effects, such as unusual physical symptoms and slips of speech.

### ***II.5.4.Amnesia***

This is loss of memory that occurs due to damage of the brain that may be permanent or temporary. Amnesia may occur due to the accident that leaves the head/brain damaged. This can wipe out traces of memory before and during the accident. It can also be caused by severe psychological stress.

### ***II.5.5.Needs***

Personal needs determine what people remember and what they can easily forget. For instance, a student who needs to pass his examination will read notes, textbooks and exchange ideas with his/her colleagues about what was taught. He/she will remember the facts and write them down during the examination. But after the exam he/she forgets almost all of what had been learnt. This is because he/she is not motivated anymore and so does not need those facts.



### ***II.5.6 Interest***

Interest is an important factor in remembering and forgetting. It is related to a person's needs. People tend to be interested in people, objects or subjects that satisfy their needs. But people will develop negative to objects or subjects that do not give satisfaction or pleasure.

### ***II.5.7 Organization of information to be memorized (encoding)***

When people encode information into memory, they convert it from one form to another to help memorization. See the example given on processes of memory.

### ***II.5.8 Associations***

When we associate or attach information to other information it becomes easier to remember. For example, the smell of a perfume can remind you your friend who often used the same kind of perfume

***II.5.9 Distinctiveness*** is another principle that determines the effectiveness of retrieval cues. Suppose a group of people is instructed to study a list of 100 items. Ninety-nine are words, but one item in the middle of the list is a picture of an elephant. Almost everyone would remember the elephant. That is because any distinctive information is easier to remember than that which is similar or usual.

## **II.6. Forgetting**

*Forgetting* is defined as the loss of information over time. Under most conditions, people recall information better soon after learning it than after a long delay; as time passes, they forget some of the information. We have all failed to remember some bit of information when we need it, so we often see forgetting as a bother. However, forgetting can also be useful because we need to continually update our memories. When we move and receive a new telephone number, we need to forget the old one and learn the new one. If you park your car every day on a large lot, you need to remember where you parked it today and not yesterday or the day before. Thus, forgetting can have an adaptive function.

### ***Theories of forgetting***

### ❖ Theory of disuse or theory of decay

This theory is also known as the theory of decay. It advocates that the impressions created by learning in the cortex fade away as time passes. For instance, you may meet a woman and forget her name or her face after sometime, or after learning some task in the class a student may fail to retrieve the facts related to it because he/she did not bother to use the facts after learning. The disuse or decay operates to produce inability to recall learnt task leading to loss in memory. Review and practice of learnt task would prevent forgetting while disuse i.e., the absence of review causes forgetting.

In terms of behaviour sphere, disuse of one performance means that other performances have crowded it, old habits being displaced by new habits and old experiences erased from memory by continual rush of new experiences.

Instances of excellent retention may be realised in numerous activities of life such as swimming, cycling, driving etc. even after passage of a long time interval these learnt activities are never forgotten.

The two evidences that have been cited above seem to be inconsistent with the theory of disuse. They direct our attention to another factor that may play an important role in forgetting.

### ❖ Interference Theory of Forgetting

#### *-Retroactive interference*

It occurs when the learning of the task is immediately followed by another learning that resembles the previous learning. The more closely the second activity/learning resembles the first one the greater the interference.

Example: After learning the causes of World War I (WW I) in the first lesson then in the next lesson, causes of World War II (WW II) are taught then forgetting is likely to be in the case of causes of WW I.

#### **Illustration of retroactive interference**

Experimental group	Learn WW I	Learn WW II	Retention period	Recall WW I 40%
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Control group	Learn WW I	.....	Retention period	Recall WW I 85%
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Results have always shown that the control group performs better than the experimental group. This is because **of interference of the second task that blocks the recall of the first task** in the experimental group.

***-Proactive interference***

This is a phenomenon which is closely related to retroactive inhibition. It is an explanation of forgetting in which old knowledge or information interferes with the learning or recall of new information. In other words, it occurs when previous learning interferes with the recall of present or later learning. Proactive inhibition or interference is the forgetting that is more experienced in daily life

**Illustration of proactive interference**

Experimental group	Learn List 'A'	Learn List 'B'	Retention period	Recall List 'B' 45%
Control group	.....	Learn List 'B'	Retention period	Recall List 'B' 90%

Let the experimental group learn both lists 'A' and 'B'. Then they rest during a retention interval after which the group is tested on list 'B'. The control group is treated in the same way as the experimental group except that it does not learn list 'A'. The results usually indicate that the control group performs better than the experimental group. This is because of learning of list 'A' that was done only by experimental group and it had interfering effect on the remembering of list 'B'.

## **CHAPTER III. INTELLIGENCE**

### **3.1 Many definitions of intelligence**

Most people have an intuitive notion of what intelligence is, and many words in the English language distinguish between different levels of intellectual skills: bright, dull, smart, stupid, clever, slow, and so on. Yet no universally accepted definition of intelligence exists, and people continue to debate what, exactly, it is.

For some people, intelligence refers to a general mental capability to reason, solve problems, think abstractly, learn and understand new material, and profit from past experience. Intelligence can be measured by many different kinds of tasks. Likewise, this ability is expressed in many aspects of a person's life. Intelligence draws on a variety of mental processes, including memory, learning, perception, decision-making, thinking, and reasoning.

Whenever scientists are asked to define intelligence in terms of what causes it or what it actually is, almost every scientist comes up with a different definition. For example, in 1921 an academic journal asked 14 prominent psychologists and educators to define intelligence. The journal received 14 different definitions, although many experts emphasized the ability to learn from experience and the ability to adapt to one's environment.

In 1986 researchers repeated the experiment by asking 25 experts for their definition of intelligence. The researchers received many different definitions: general adaptability to new problems in life; ability to engage in abstract thinking; adjustment to the environment; capacity for knowledge and knowledge possessed; general capacity for independence, originality, and productiveness in thinking; capacity to acquire capacity; apprehension of relevant relationships; ability to judge, to understand, and to reason; deduction of relationships; general cognitive ability.

According to other researchers, conceptions of intelligence vary from culture to culture. For example, North Americans often associate verbal and mathematical skills with intelligence, but some seafaring cultures in the islands of the South Pacific view spatial memory and navigational skills as markers of intelligence.

### **3.2. Measuring intelligence using mental tests**

The modern intelligence-testing movement began at the turn of 20<sup>th</sup> century when Certain French children were seemed unable to benefit from the normal Public schooling. Educators wanted an objective way to identify these children as early as possible so that some form of special education could be arranged for them. It was for that purpose that in 1905 French psychologist Alfred Binet and colleague Théodore Simon developed tests to measure children's mental abilities . Children were asked, among other tasks, to perform simple commands and gestures, repeat spoken digits, name objects in pictures, define common words, tell how two objects are different, and define abstract terms. Similar items are used in today's intelligence tests. Binet and Simon published their first test in 1905. Revisions to this test followed in 1908 and 1911.

Binet and Simon assumed that all children follow the same course of intellectual development but develop at different rates. In developing their test, they noted which items for example, were successfully completed by half of seven-year-olds, which items by half of eight-year-olds, and so on. Through these observations they created the concept of *mental age*. If a 10-year-old child succeeded on the items appropriate for 10-year-olds but could not pass the questions appropriate for 11-year-olds, that child was said to have a mental age of 10. Mental age did not necessarily correspond with **chronological age**. For example, if a 6-year-old child succeeded on the items intended for 9-year-olds, then that child was said to have a mental age of 9.

### ❖ *The IQ*

American psychologist, Lewis Terman, revised the test by adapting some of Binet's questions, adding questions appropriate for adults, and establishing new standards for average performance at each age. Terman's first adaptation, published in 1916, was called the Stanford-Binet Intelligence Scale. The name of the test derived from Terman's affiliation with Stanford University. The Stanford-Binet Intelligence Scale, is still used today.

Instead of giving a person's performance on the Stanford-Binet as a mental age, Terman converted performance into a single score, called the *intelligence quotient*, or *IQ* which is obtained by dividing the mental age by the actual, chronological age of the person taking the test and then multiplied by 100 to remove the decimal point. For example, if a 6-year-old girl scored a mental age of 9, she would be assigned an IQ of 150 ( $9/6 \times 100$ ). If a 12-year-old boy scored a mental age of 6, he would be given an IQ of 50 ( $6/12 \times 100$ ). The IQ score, as originally computed, expressed a person's mental age relative to his or her chronological age.

Although this formula works adequately for comparing children, it does not work well for adults because intelligence decrease during adulthood.

#### ❖ *Some criticisms of Intelligence Tests*

- In many circumstances, intelligence testing has been criticized for the following reasons: One criticism of intelligence tests is that they do not really measure intelligence but only a narrow set of mental capabilities. For example, intelligence tests do not measure wisdom, creativity, common sense, social skills, and practical knowledge which are abilities that allow people to adapt well to their surroundings and solve daily problems. The merit of this criticism depends on how one defines intelligence. Some theorists consider wisdom, creativity, and social competence aspects of intelligence, but others do not. Psychologists know little about how to objectively measure these other abilities.
- Another criticism of IQ tests is that some people may not perform well because they become anxious when taking any test. Their poor performance may reflect their anxiety rather than their true abilities.
- Intelligence tests are judged biased: Psychologists have long known that ethnic and racial groups differ in their average scores on intelligence tests. For example, African Americans as a group consistently average 15 points lower than whites on IQ tests. Such differences between groups have led some people to believe that **intelligence tests are culturally biased**. An example of this bias has been given by a group of black parents in California in 1979. They cited the fact that black children were disproportionately represented in special education classes. Placement in these classes depended in part on the results of IQ tests.

#### ❖ **Extremes of Intelligence: Retardation and Giftedness**

##### **Extremely Low Intelligence( retardation)**

One end of the distribution of intelligence scores is defined by people with very low IQ. Mental retardation is a generalized disorder ascribed to people who have an IQ below 70, who have experienced deficits since childhood, and who have trouble with basic life skills, such as dressing and feeding oneself and communicating with others. Mental retardation is divided into four categories: mild, moderate, severe, and profound.

## Extremely High Intelligence

Extreme high intelligent people have the IQ of about 135 or higher. Having extremely high IQ is clearly less of a problem than having extremely low IQ, but there may also be challenges to being particularly smart. It is often assumed that school children who are labeled as “gifted” may have adjustment problems that make it more difficult for them to create social relationships.

### 3.3 Theories of intelligence

Scholars have tried to understand the nature of intelligence for many years, but they still do not agree on a single theory or definition. Some theorists try to understand intelligence by analyzing the results of intelligence tests and identifying clusters of abilities. Other theorists believe that intelligence encompasses many abilities not captured by tests. In recent years, some psychologists have tried to explain intelligence from a biological standpoint.

#### 3.3.1. *General intelligence: Charles Spearman*

Efforts to explain intelligence began even before Binet and Simon developed the first intelligence test. In the early 1900s British psychologist Charles Spearman made an important observation that has influenced many later theories of intelligence: He noted that all tests of mental ability were positively correlated. *Correlation* is the degree to which two variables are associated and vary together. Spearman found that individuals who scored high on any one of the mental tests he gave tended to score high on all others. Conversely, people who scored low on any one mental test tended to score low on all others.

Spearman reasoned that if all mental tests were positively correlated, there must be a common variable or factor producing the positive correlations. In 1904 Spearman published a major article about intelligence in which he used a statistical method (**called factor analysis**) to show that the positive correlations among mental tests resulted from a common underlying factor.

Based on his factor analysis, Spearman proposed that two factors could account for individual differences in scores on mental tests. He called the first factor *general intelligence* or the *general factor*, represented as *g*. The *g* factor represented what all of the mental tests had in common. Scores on all of the tests were positively correlated, Spearman believed, because all of the tests drew on *g*. The second factor Spearman identified was the *specific factor*, or *s*. The specific factor related to whatever unique abilities a particular test required, so it differed

from test to test. Spearman and his followers placed much more importance on general intelligence than on the specific factor.

### ***3.3.2. Primary mental abilities: Louis L. Thurstone***

Some of other psychologists did not agree with Spearman on the factor “g”. In 1938 American psychologist Louis L. Thurstone proposed that intelligence was not one general factor, but a small set of independent factors of equal importance. He called these factors *primary mental abilities*. To identify these abilities, Thurstone and his wife, Thelma, devised a set of 56 tests. They administered tests to 240 college students and analyzed the resulting test scores with new methods of factor analysis that Thurstone had devised. Thurstone identified **seven** primary mental abilities: **(1) verbal comprehension**, the ability to understand word meanings; **(2) verbal fluency**, or speed with verbal material, as in making rhymes; **(3) number, or arithmetic ability**; **(4) memory**, the ability to remember words, letters, numbers, and images; **(5) perceptual speed**, the ability to quickly distinguish visual details and perceive similarities and differences between pictured objects; **(6) inductive reasoning**, or deriving general ideas and rules from specific information; and **(7) spatial visualization**, the ability to mentally visualize and manipulate objects in three dimensions.

### ***3.3.3. Fluid intelligence and crystallized intelligence: Raymond Cattell and John Horn***

In the 1960s American psychologists Raymond Cattell and John Horn applied new methods of factor analysis and concluded there are two kinds of general intelligence: **fluid intelligence ( $g_f$ )** and **crystallized intelligence ( $g_c$ )**. *Fluid intelligence* represents the biological basis of intelligence. Measures of fluid intelligence, such as speed of reasoning and memory, increase into adulthood and then decline due to the aging process. *Crystallized intelligence*, on the other hand, is the knowledge and skills obtained through learning and experience. As long as opportunities for learning are available, crystallized intelligence can increase indefinitely during a person’s life. Cattell also developed what he called **investment theory**. This theory sought to explain how an investment of biological basis (fluid intelligence) could contribute to learned skills and knowledge (crystallized intelligence). As one might expect, it is very difficult to separate the biological basis of intelligence from what is learned. As Cattell was aware, nearly all mental tests draw on both crystallized and fluid intelligence. Consequently, crystallized and fluid abilities are correlated with each other.



#### ***2.3.4. Multiple intelligences: Howard Gardner***

In 1983 American psychologist Howard felt that the concept of intelligence, as it had been defined by mental tests, did not capture all of the ways humans can excel. Gardner argued that we do not have one underlying general intelligence, but instead have multiple intelligences, each part of an independent system in the brain.

In formulating his theory, Gardner examined for example studies of brain-damaged people who had lost one ability, such as spatial thinking, but retained another, such as language. The fact that two abilities could operate independently of one another suggested the existence of separate intelligences. Gardner also proposed that evidence for multiple intelligences came from prodigies and savants. *Prodigies* are individuals who show an exceptional talent in a specific area at a young age, but who are normal in other aspects. *Savants* are people who score low on IQ tests, and who may have only limited language or social skills but demonstrate some remarkable ability, such as extraordinary memory or drawing ability. To Gardner, the presence of certain high-level abilities in the absence of other abilities also suggested the existence of multiple intelligences.

Gardner identified the following intelligences : **Linguistic intelligence** involves aptitude with speech and language. **Logical-mathematical intelligence** involves the ability to reason abstractly and solve mathematical and logical problems. **Spatial intelligence** is used to perceive visual and spatial information and to conceptualize the world in tasks like navigation and in art. **Musical intelligence**, the ability to perform and appreciate music. **Bodily-kinesthetic intelligence** is the ability to use one's body or portions of it in various activities, such as dancing, athletics, acting, surgery, and magic. **Interpersonal intelligence** involves understanding others and acting on that understanding. **Intrapersonal intelligence** is the ability to understand one's self. In the late 1990s Gardner added an eighth intelligence to his theory: **naturalist intelligence**, the ability to recognize and classify plants, animals, and minerals. According to Gardner, each person has a unique profile of these intelligences, with strengths in some areas and weaknesses in others.

#### ***2.3.5. Triarchic theory of intelligence: Robert Sternberg***

In the 1980s American psychologist Robert Sternberg proposed a theory of intelligence that, like Gardner's theory of multiple intelligences, attempted to expand the traditional conception of intelligence. Sternberg noted that mental tests are often imperfect predictors of real-world

performance or success. People who do well on tests sometimes do not do as well in real-world situations. According to Sternberg's triarchic (three-part) theory of intelligence, intelligence consists of three main aspects: analytic intelligence, creative intelligence, and practical intelligence. These are not multiple intelligences as in Gardner's theory, but interrelated parts of a single system.

**Analytic intelligence** is the part of Sternberg's theory that most closely resembles the traditional conception of general intelligence. Analytic intelligence is skill in reasoning, processing information, and solving problems. It involves the ability to analyze, evaluate, judge, and compare. Analytic intelligence draws on basic cognitive processes or components.

**Creative intelligence** is skill in using past experiences to achieve insight and deal with new situations. According to Sternberg, traditional intelligence tests do not measure creative intelligence, because it is possible to score high on an IQ test yet have trouble dealing with new situations.

**Practical intelligence** relates to people's ability to adapt to, select, and shape their real-world environment. It involves skill in everyday living and in adapting to life demands, and reflects a person's ability to succeed in real-world settings.

In Sternberg's view, "successfully intelligent" people are aware of their strengths and weaknesses in the three areas of intelligence. They figure out how to capitalize on their strengths, compensate for their weaknesses, and further develop their abilities in order to achieve success in life.

### **3.4 Factors of intelligence: Heredity and environment**

Today, almost all scientists agree that intelligence arises from the influence of both genetic and environmental factors. Careful study is required in order to attribute any influence to either environment or heredity.

#### ***3.4.1. Genetic Influences***

Some of the strongest evidence for genetic influences in intelligence comes from studies of identical twins adopted into different homes early in life and thus raised in different environments. These studies have found that between 40% and 80% of the variability in IQ is due to genetics, meaning that overall genetics plays a bigger role in creating IQ differences

among individuals. The IQs of identical twins correlate very highly ( $r = .86$ ), much higher than do the scores of fraternal twins who are less genetically similar ( $r = .60$ ). And the correlations between the IQs of parents and their biological children ( $r = .42$ ) is significantly greater than the correlation between parents and adopted children ( $r = .19$ ).

### **3.4.2. Environmental Influences**

Environmental factors comprise all the stimuli a person encounters from conception to death, including food, cultural information, education, and social experiences. Scientists have identified specific environmental variables that have direct and clear effects on intelligence. Many environmental variables have effects and differ in their effect on each person.

Schooling is an important factor that affects intelligence. Children who do not attend school or who attend intermittently score more poorly on IQ tests than those who attend regularly, and children who move from low-quality schools to high-quality schools tend to show improvements in IQ.

Researches have shown however that there is an interdependence between environment and heredity in influencing someone's intelligence. For example, one measure commonly used to assess a child's home environment is the number of books in the home. But having many books in the home may be related to the parents' IQ, because highly intelligent people tend to read more. The child's intelligence may be due to the parents' genes or to the number of books in the home. Further, parents may buy more books in response to their child's genetically influenced intelligence. Which of these possibilities is correct cannot be determined without thorough studies of all the factors involved.

## **CHAPTER IV EMOTION**

### **IV.1. Introduction**

What is emotion? A feeling? Then what is a feeling? These terms are difficult to define and even more difficult to understand completely. People have been attempting to understand this phenomenon for thousands of years, and will most likely debate for a thousand more. This section will present the various theories related to the acquisition of emotion.

Emotion refers to a **feeling state involving thoughts, physiological changes, and an outward expression or behavior**. But what comes first? The thought? The physiological arousal? The behavior? Or does emotion exist in a vacuum, whether or not these other components are present? There are five theories which attempt to understand why we experience emotion.

## **IV.2. Theories of emotions**

### ***IV.2.1. James-Lange Theory***

The James-Lange theory of emotion argues that an event causes physiological arousal first and then we interpret this arousal. Only after our interpretation of the arousal can we experience emotion. If the arousal is not noticed or is not given any thought, then we will not experience any emotion based on this event.

EXAMPLE: You are walking down a dark alley late at night. You hear footsteps behind you and you begin to tremble, your heart beats faster, and your breathing deepens. You notice these physiological changes and interpret them as your body's preparation for a fearful situation. You then experience fear.

**EVENT ----> AROUSAL ----> INTERPRETATION ----> EMOTION**

### ***IV.2.2. Cannon-Bard Theory***

The Cannon-Bard theory argues that we experience physiological arousal and emotion at the same time, but gives no attention to the role of thoughts or outward behavior.

EXAMPLE: You are walking down a dark alley late at night. You hear footsteps behind you and you begin to tremble, your heart beats faster, and your breathing deepens. At the same time as these physiological changes occur you also experience the emotion of fear.



### *IV.2.3. Schachter-Singer Theory*

According to this theory, an event causes physiological arousal first. You must then identify a reason for this arousal and then you are able to experience and label the emotion.

EXAMPLE: You are walking down a dark alley late at night. You hear footsteps behind you and you begin to tremble, your heart beats faster, and your breathing deepens. Upon noticing this arousal you realize that it comes from the fact that you are walking down a dark alley by yourself. This behavior is dangerous and therefore you feel the emotion of fear.



### *IV.2.4. Lazarus Theory*

Lazarus Theory states that a thought must come before any emotion or physiological arousal. In other words, you must first think about your situation before you can experience an emotion.

EXAMPLE: You are walking down a dark alley late at night. You hear footsteps behind you and you think it may be a mugger so you begin to tremble, your heart beats faster, and your breathing deepens and at the same time experience fear.



### *IV.2.5 Facial Feedback Theory*

According to the facial feedback theory, emotion is the experience of changes in our facial muscles. In other words, when we smile, we then experience pleasure, or happiness. When we frown, we then experience sadness. It is the changes in our facial muscles that cue our

brains and provide the basis of our emotions. Just as there are an unlimited number of muscle configurations in our face, so there are a seemingly unlimited number of emotions.

Example: You are walking down a dark alley late at night. You hear footsteps behind you and your eyes widen, your teeth clench and your brain interprets these facial changes as the expression of fear. Therefore you experience the emotion of fear

## **CHAPTER V: MOTIVATION**

### **V.1. Concept of motivation**

What triggers a behavior? Any organism is often if not always active. The psychologists wanted to know what triggers the activity or behavior, towards certain goals; allow it to extend and stop in time.

Motivation refers to conditions that trigger or initiate, guide and sustain behaviors usually until a goal is reached or any behaviors that are disrupted.

The concept of motivation covers all episodes of behavior *that generate, select and orient the activities of the individual*. A series of psychological and physical phenomena are involved: instinct, drive, need, interest, attention.

### **V.2. Types of motivation**

Generally we distinguish-

- Innate motivations (survival);
- Acquired motivations (social interactions);
- combined motivations

#### ***V.2.1 Innate motivations***

There are those ones which are very necessary to the organism because this last cannot survive without them. They are corresponding to hunger, thirst, the need to escape pain,

temperature, ...

The motivations for these behaviors are described by verbs such as eat, drink, relax, eliminate waste, ...

### ***V.2.2. Acquired Motivations***

They are those which develop from social or environmental interactions. They develop from punishments and rewards distributed by the social environment

Ex: - the need for achievement

- The need for friendship
- The need to play
- The need for autonomy

None of these needs is essential to the survival of the species and none seem to have innate components.

### ***V.2.3 Combined motivations***

Those resulting from the combination of characters learned and innate characteristics.

Ex: - sexual need

## **V.3. Conflicts of motivation**

Two or more motives may conflict when the body is subject to two or more motives simultaneously. There are 3 types:

### ***V.3.1 The approach-approach conflict***

The individual must choose between two or more equally desirable goal objects. The conflict derived from the fact that only one answer can be chosen.

Ex: In front of several tasty dishes if you want to taste one, you will find conflicting motivation.

### ***V.3.2. The avoidance-avoidance conflict***

In this case one or more individuals must choose between two or more undesirable goal objects events.

Ex: Given the choice to imprison his father or his child. What happens in such situations, we find that the individual, rather than choose, he holds (do nothing).

### **V.3.3.The approach-avoidance conflict**

An object has two opposite aspects: the desirable aspects and undesirable aspects.

Example in the studies:

- Desirable aspect: being graduated and having a job which give you much money
- Undesirable aspect: hard work that can prevent engaging in other meaningful activities.

### **V.4. Theories of motivation**

There are several distinct theories of motivation we will discuss in this section. Some include basic biological forces, while others seem to transcend concrete explanation. Let's talk about the six major theories of motivation.

#### ***V.4.1.Instinct Theory***

All creatures are born with specific innate knowledge about how to survive. Animals are born with the capacity of how to survive by spinning webs, building nests, avoiding danger. ***These innate tendencies are preprogrammed at birth, they are in our genes,*** and even if the spider never saw a web before, never witnessed its creation, it would still know how to create one.

Humans have the same types of innate tendencies. Babies are born with a unique ability that allows them to survive; they are born with the ability to cry. Without this, how would others know when to feed the baby, know when he needed changing, or when she wanted attention and affection? Crying allows a human infant to survive

#### ***V.4.2.Drive Reduction Theory***

According to Clark Hull (1943, 1952), humans have **internal biological needs** which motivate them to perform a certain way. These needs, or drives, are defined by Hull ***as internal states of arousal or tension which must be reduced.*** A prime example would be the internal feelings of hunger or thirst, which motivates us to eat. According to this theory, we are driven to reduce these drives so that we may maintain a sense of internal calmness.



### ***V.4.3.Arousal Theory***

Similar to Hull's Drive Reduction Theory, Arousal theory states that we are driven *to maintain* a certain level of *arousal in order to feel comfortable*. Arousal refers to a state of emotional, intellectual, and physical activity.

### ***V.4.4.Psychoanalytic Theory***

Sigmund Freud believed that humans have only two basic drives: Eros and Thanatos, or the Life and Death drives. According to Psychoanalytic theory, everything we do, every thought we have, and every emotion we experience has one of two goals: *to help us survive or to prevent our destruction*. This is similar to instinct theory, however, Freud believed that the vast majority of our knowledge about these drives is buried in the unconscious part of the mind.

Psychoanalytic theory therefore argues that we go to school because it will help assure our survival in terms of improved finances, more money for healthcare, or even an improved ability to find a spouse. We move to better school districts to improve our children's ability to survive and continue our family tree. According to this theory, everything we do can be traced back to the two basic drives.

### ***V.4.5.Humanistic Theory***

Humanistic theory is perhaps the most well known theory of motivation. According to this theory, humans are **driven to achieve their maximum potential and will always do so** unless obstacles are placed in their way. These obstacles include hunger, thirst, financial problems, safety issues, or anything else that takes our focus away from maximum psychological growth.

The best way to describe this theory is to utilize the famous pyramid developed by Abraham Maslow (1970) called the Hierarchy of Needs. Maslow believed that humans have specific needs that must be satisfied and that if lower level needs are not satisfied, we cannot possibly strive for higher level needs. The Hierarchy of Needs shows that at the lower level, we must

focus on basic issues such as food, sleep, and safety. Without food, without sleep, how could we possibly focus on the higher level needs such as respect, education, and recognition?

### Pyramid of needs



#### V.4.6. Learning Theory

The theory that leads to success or failure can be learned through personal experience or by the imitation game. **If the behavior of an individual leads to the satisfaction of a need, the individual will tend to repeat it but the corresponding need to failure will tend to disappear.**

## CHAPTER VI: LEARNING

### VI.1. Introduction

The term “learning” can be defined as acquiring knowledge or developing the ability to perform new behaviors. It is common to think of learning as something that takes place in school, but much of human learning occurs outside the classroom, and people continue to learn throughout their lives.

Even before they enter school, young children learn to walk, to talk, and to use their hands to manipulate toys, food, and other objects. They use all of their senses to learn about the sights, sounds, tastes, and smells in their environments. They learn how to interact with their parents, siblings, friends, and other people important to their world. When they enter school, children learn basic academic subjects such as reading, writing, and mathematics. They also continue to learn a great deal outside the classroom. They learn which behaviors are likely to be

rewarded and which are likely to be punished. They learn social skills for interacting with other children. After they finish school, people must learn to adapt to the many major changes that affect their lives, such as getting married, raising children, and finding and keeping a job.

There are many forms of learning, ranging from simple to complex. Simple forms of learning involve a single stimulus. A *stimulus* is anything perceptible to the senses, such as a sight, sound, smell, touch, or taste. In a form of learning known as classical conditioning, people learn to associate two stimuli that occur in sequence, such as lightning followed by thunder. In operant conditioning, people learn by forming an association between a behavior and its consequences (reward or punishment). People and animals can also learn by observation, that is, by watching others perform behaviors. More complex forms of learning include learning languages, concepts, and motor skills.

## **VI.2. Some forms of learning**

### ***VI.2.1. Learning by conditioning***

#### **❖ Classical conditioning**

#### **Pavlov's experiments**

Classical conditioning was discovered in the early 1900s by Russian physiologist Ivan Pavlov. Pavlov was studying how saliva aids the digestive process. He would give a dog some food and measure the amount of saliva the dog produced while it ate the meal. After the dog had gone through this procedure a few times, however, it would begin to salivate before receiving any food. Pavlov reasoned that some new stimulus, such as the experimenter in his white coat, had become associated with the food and produced the response of salivation in the dog. Pavlov spent the rest of his life studying this basic type of associative learning, which is now called classical conditioning or *Pavlovian conditioning*.

#### **Principles of classical conditioning**

Pavlov and his associates identified four main processes: acquisition, extinction, generalization, and discrimination.

### ***Acquisition***

The *acquisition* occurs when the dog learned to salivate at the sound of the bell. Several factors can affect the speed of conditioning during the acquisition phase. The most important factors are the ***order and timing of the stimuli***. Conditioning occurs most quickly when the bell precedes the food by about half a second. However, conditioning takes longer and the response is weaker when for example the dog receives the food before the bell is rung, conditioning seldom occurs.

### ***Extinction***

Once learned, a conditioned response is not necessarily permanent. If a dog has learned to salivate at the sound of a bell, an experimenter can gradually extinguish the dog's response by repeatedly ringing the bell without presenting food afterward. Extinction does not mean, however, that the dog has simply unlearned or forgotten the association between the bell and the food. After extinction, if the experimenter lets a few hours pass and then rings the bell again, the dog will usually salivate at the sound of the bell once again. The reappearance of an extinguished response after some time has passed is called ***spontaneous recovery***.

### ***Generalization***

After an animal has learned a conditioned response to one stimulus, it may also respond to similar stimuli without further training. If a child is bitten by a large black dog, the child may fear not only that dog, but other large dogs. This phenomenon is called ***generalization***. Less similar stimuli will usually produce less generalization. For example, the child may show little fear of smaller dogs.

### ***Discrimination***

The opposite of generalization is ***discrimination***, in which an individual learns to produce a conditioned response to one stimulus but not to another stimulus that is similar. For example, a child may show a fear response to freely roaming dogs, but may show no fear when a dog is on a leash or confined to a pen.

### **Application of classical conditioning**

Many of our behaviors today are shaped by the pairing of stimuli. Have you ever noticed that certain stimuli, such as the smell of a cologne or perfume, a certain song, a specific day of the year, results in fairly intense emotions? It's not that the smell or the song are the cause of the emotion, but rather what that smell or song has been paired with, perhaps an ex-boyfriend or ex-girlfriend, the death of a loved one, or maybe the day you met your current husband or wife. We make these associations all the time and often don't realize the power that these connections or pairings have on us. But, in fact, we have been classically conditioned.

### ❖ *Operant conditioning*

Another type of learning is called Operant Conditioning. The term "Operant" refers **to how an organism operates on the environment**, and hence, operant conditioning comes from how we respond to what is presented to us in our environment. It can be thought of as learning due to the natural consequences of our actions

#### Thorndike's Law of Effect

Some of the earliest scientific research on operant conditioning was conducted by American psychologist Edward L. Thorndike at the end of the 19th century. Thorndike's research subjects included cats, dogs, and chickens. To see how animals learn new behaviors, Thorndike used a small chamber that he called a puzzle box. He would place an animal in the puzzle box, and if it performed the correct response (such as pulling a rope, pressing a lever, or stepping on a platform), the door would swing open and the animal would be rewarded with some food located just outside the cage. Based on these experiments, Thorndike developed a principle he called the *law of effect*. This law states that behaviors that are followed by pleasant consequences will be strengthened, and will be more likely to occur in the future. Conversely, behaviors that are followed by unpleasant consequences will be weakened, and will be less likely to be repeated in the future. Thorndike's law of effect is another way of describing what modern psychologists now call operant conditioning.

#### B.f Skinner's experiments

American psychologist B. F. Skinner became one of the most famous psychologists in history for his pioneering research on operant conditioning. In fact, he coined the term *operant conditioning*. Beginning in the 1930s, Skinner spent several decades studying the behavior of

animals usually rats or pigeons in chambers that became known as *Skinner boxes*. Like Thorndike's puzzle box, the Skinner box was a barren chamber in which an animal could earn food by making simple responses, such as pressing a lever or a circular response key. A device attached to the box recorded the animal's responses. Skinner became famous not just for his research with animals, but also for his controversial claim that the principles of learning he discovered using the Skinner box also applied to the behavior of people in everyday life. Skinner acknowledged that many factors influence human behavior. He maintained for example that rewards and punishments control the great majority of human behaviors, and that the principles of operant conditioning can explain these behaviors.

### **Principles of operant conditioning**

Skinner identified a number of basic principles of operant conditioning that explain how people learn new behaviors or change existing behaviors. The main principles are reinforcement, punishment, shaping, extinction, discrimination, and generalization.

#### ***Reinforcement***

In operant conditioning, *reinforcement* refers to any process that strengthens a particular behavior, that is, increases the chances that the behavior will occur again.

#### ***Punishment***

Whereas reinforcement strengthens behavior, *punishment* weakens it, reducing the chances that the behavior will occur again

#### ***Shaping***

*Shaping* is a reinforcement technique that is used to teach animals or people behaviors that they have never performed before. In this method, the teacher begins by reinforcing a response the learner can perform easily, and then gradually requires more and more difficult responses. For example, to teach a rat to press a lever that is over its head, the trainer can first reward any upward head movement, then an upward movement of at least one inch, then two inches, and so on, until the rat reaches the lever. Psychologists have used shaping to teach children with severe mental retardation to speak by first rewarding any sounds they make,

and then gradually requiring sounds that more and more closely resemble the words of the teacher.

### ***\*Extinction***

As in classical conditioning, responses learned in operant conditioning are not always permanent. In operant conditioning, *extinction* is the elimination of a learned behavior by discontinuing the reinforcer of that behavior. If a rat has learned to press a lever because it receives food for doing so, its lever-pressing will decrease and eventually disappear if food is no longer delivered.

### ***\*Generalization and discrimination***

Generalization and discrimination occur in operant conditioning in much the same way that they do in classical conditioning. In *generalization*, people perform a behavior learned in one situation in other, similar situations. For example, a man who is rewarded with laughter when he tells certain jokes at a bar may tell the same jokes at restaurants, parties, or wedding receptions. *Discrimination* is learning that a behavior will be reinforced in one situation but not in another. The man may learn that telling his jokes in church or at a serious business meeting will not make people laugh

### **Applications of operant conditioning:**

Operant conditioning techniques have practical applications in many areas of human life. Parents who understand the basic principles of operant conditioning can reinforce their children's appropriate behaviors and punish inappropriate ones.

### ***VI.2.2. Learning by observation***

Learning by observation differs from classical and operant conditioning because it does not require direct personal experience with stimuli, reinforcers, or punishers. Learning by observation involves simply **watching the behavior of another person, called a *model*, and later imitating the model's behavior.**

### ***VI.2.3 Learning by Insight***

One type of learning that is not determined only by conditioning occurs when we suddenly find the solution to a problem, as if the idea just popped into our head. This type of learning is known as insight, *the sudden understanding of a solution to a problem*.

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